Simplicity and Substantiality
The Development of 'Simple Substance' as a Key Notion in Leibniz's Philosophy

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To Maria Rosa Antognazza
for providing a never-ending thread through various labyrinths.

Table of Contents

Abstract

In this thesis, I will argue that there are various considerations which drove Leibniz to the adoption of simplicity as a fundamental criterion for substantiality. 'Simplicity' seems to be a deceivingly obvious term, but on closer inspection it turns out to be nonetheless in need of further explanation. Leibniz's definition as that which is 'without parts' does not lead us to an understanding unless it is clearly set out what 'being a part' entails and whether simplicity goes beyond indivisibility. The reconstruction of such considerations will be of help in carving out a more determinate content of this notion as it features in Leibniz's metaphysical system, and will explain how it came to be assigned a core function in his philosophy. Various undertakings throughout his lifetime about activity, unity, indivisibility and impredicability finally culminate in the notion of simplicity.

Within this overall development, several different areas of science and philosophy have taken influence on Leibniz's considerations. There is, obviously, an overreaching *metaphysical strand*, which tries to account for a notion of substance that is in accordance with the requirements from other, more specific strands. Some demands derive from Leibniz's reflections on *physics*, most importantly the notion of force, and from *logical considerations* concerning the concept of substance. Equally important are *theological considerations* concerning the simplicity of God, and thus the hierarchy of monads and their similarity with God. Part of the answer as to what to regard and not to regard as partless, i.e. simple, can also be found in Leibniz's *mathematical writings*. First and foremost it is mereology that occupies itself with the notions of parts and wholes and will thus give clues as to how to understand the terms explicitly involved in the definition of 'simplicity'. But Leibniz also frequently feels the need to resort to mathematics and the notions of 'point' and 'function' in order to illuminate the notion of a simple substance. Bringing all these strands together will finally give a clearer picture of what it means to be a Leibnizian *simple* substance.

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I have benefitted from having available a wide range of excellent literature written on Leibniz, among them Shane Duarte, who has kindly provided me with a manuscript of his forthcoming paper on 'Leibniz and Prime Matter'.

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Abbreviations

A Leibniz, Gottfried Wilhelm. *Sämtliche Schriften und Briefe*, ed. Deutsche Akademie der Wissenschaften (Darmstadt und Berlin: Akademie-Verlag, 1923–). Referenced by series, volume and page.

AG Leibniz, Gottfried Wilhelm. *Philosophical Essays*, ed. and trans. Roger Ariew and Daniel Garber (Indianapolis: Hackett, 1989).

C Leibniz, Gottfried Wilhelm. *Opuscules et fragments inédits de Leibniz*, ed. Louis Couturat (Paris: Felix Alcan, 1903).

DS Leibniz, Gottfried Wilhelm. *Leibnitz*'s *Deutsche Schriften,* 2 vols., ed. G. E. Guhrauer (Berlin: Veit, 1838– 40). Referenced by volume and page.

G Leibniz, Gottfried Wilhelm. *Die philosophischen Schriften*, 7 vols., ed. C. I. Gerhardt (Berlin: Weidmann, 1875–90). Referenced by volume and page.

GM Leibniz, Gottfried Wilhelm. *Leibnizens mathematische Schriften*, 7 vols., ed. C. I. Gerhardt (Berlin: A. Asher, and Halle: H.W. Schmidt, 1849–63; Reprint, Hildesheim: Georg Olms, 1971). Referenced by volume and page.

Gr Leibniz, Gottfried Wilhelm. *Textes inédits d'après des manuscrits de la Bibliothèque provincale d'Hanovre*, ed. Gaston Grua (Paris: Presses Universitaires de France, 1948).

L Leibniz, Gottfried Wilhelm. *Philosophical Papers and Letters*, 2nd edition, ed. and trans. Leroy E. Loemker (Dordrecht: Reidel, 1969).

LA Leibniz, Gottfried Wilhelm. *The Leibniz–Arnauld Correspondence*, ed. and trans. H. T. Mason (Manchester: Manchester University Press, 1967).

LDB Leibniz, Gottfried Wilhelm. *The Leibniz–Des Bosses Correspondence*, ed. and trans. Brandon Look and Donald Rutherford (New Haven: Yale University Press, 2007).

LDV Leibniz, Gottfried Wilhelm. *The Leibniz–De Volder Correspondence*, ed. and trans. Paul Lodge (New Haven: Yale University Press, 2013).

NE Leibniz, Gottfried Wilhelm. *New Essays on Human Understanding*, ed. and trans. Peter Remnant and Jonathan Bennett (Cambridge: Cambridge University Press, 1981).

RA Leibniz, Gottfried Wilhelm. *The Labyrinth of the Continuum: Writings on the Continuum Problem, 1672–1686*, ed. and trans. Richard Arthur (New Haven: Yale University Press, 2001).

SL Leibniz, Gottfried Willhelm. *The Shorter Leibniz Texts. A Collection of New Translations*, ed. and trans. Lloyd Strickland (London: Continuum, 2006).

WF Leibniz, Gottfried Wilhelm. *Leibniz's 'New System' and Associated Contemporary Texts*, ed. and trans. R. S. Woolhouse and Richard Francks (Oxford: Oxford University Press, 1997).

Introduction

> 1 The *Monad*, which we shall discuss here, is nothing but a simple substance that enters into composites – simple, that is, without parts.
> 2 And there must be simple substances, since there are composites; for the composite is nothing more than a collection, or *aggregate*, of simples.[1]

When thinking about Leibniz's notion of a 'simple substance', a wide variety of problems and worries come immediately to mind: How can something simple have a multitude of perceptions? How can many simple substances make up an extended, spatial thing? But what one might not immediately be led to ask oneself is a crucial question and a prerequisite for answering all further questions: What does it mean to be simple? 'Simplicity' seems to be an obvious term, but it turns on closer inspection out to be nonetheless one that is in need of further explanation. Its definition as that which is 'without parts' does not lead us much closer to an understanding unless it is clearly set out what 'being a part' entails. One might be tempted to immediately identify 'simplicity' with 'indivisibility'[2], but that seems a rather strong assumption, since though what is simple seems by necessity to be indivisible, this relation does not seem to hold *vice versa*.[3] The name itself that Leibniz uses in order to refer to simple substances might provide a clue: 'monad' derives from the Greek *monas*, i.e. a unit or what is one. But this does not mean that the notion of 'atoms', i.e. that which is indivisible, does not play a major part in his description of simple substances as well: "There are only *atoms of substance*, that is,

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[1] 'Monadology' (1714), G VI 607/AG 213.

[2] As seems to be done, e.g., by Robert C. Sleigh, Jr., "Leibniz on the Simplicity of Substance," *Rice University Studies* 63.4 (1977).

[3] This might not have been made explicit in the classical or early modern atomistic accounts, but it seems to be a consequence of the structure of atoms. As Bayle points out, "for every extension, no matter how small it may be, has a right and a left side, an upper and a lower side" (Pierre Bayle, *Historical and Critical Dictionary. Selections*, transl., with an introduction and notes by Richard H. Popkin (Indianapolis: Bobbs-Merrill, 1965), 360, i.e. 'Zeno', Note G). This seems even clearer in the case of Gassendi's atoms, which are not perfectly round, but have also hooks that allow them to interlock. But not only in classical theories of atomism does the reverse relation from indivisibles to simplicity not hold, it does neither for the young Leibniz, whose early attempts to account for the continuum at some point entail the claim that infinitesimals "and are characterized as lacking extension, but nonetheless containing parts having no distance from one another, what he calls "indistant" parts." (Richard T. W. Arthur, "Actual Infinitesimals in Leibniz's Early Thought," in *The Philosophy of the Young Leibniz*, ed. Mark Kulstad et al. (Suttgart: Franz Steiner Verlag, 2009), 12 [= Studia Leibnitiana Sonderhefte, Band 35.])

real unities absolutely destitute of parts […]"[4] There obviously is a strong connection between simplicity, unity, and indivisibility, but what it amounts to requires further investigation. Since Leibniz had employed the notions of unity and indivisibility for years in order to describe substances, the question arises why he felt compelled to introduce the further notion of 'simplicity' in 1695 and what he thought it might add to his philosophy. I will argue in the following that there is a development in his thinking that finally leads Leibniz to embrace the idea of simplicity as the crucial feature of substance that can be employed to capture or explain further essential features.

Any account of Leibniz's development seemingly needs to determine whether there are significant changes in his philosophy and various metaphysically different systems throughout the years[5] or if we can talk about a more or less continuous development of one system[6]. But such a decision is to some extent based on the focus of analysis and how overall consistencies and inconsistencies are weighted. The account I will propose does not require such a decision for the major part of Leibniz's writings, that is from his earliest publication in 1663 to the introduction of 'simplicity' in 1695[7] (and to a good extent even for the following years). What will be carved out is an overall framework, within which the idea of substance has developed and sharpened until it culminated in the 'monad'. This overall framework sets out to be rather general and focuses on the explanatory functions of terms rather than on the ontology of the underlying substances, i.e. while it is required that substances are active and unified, less attention will be paid to the question if they are atoms, Cartesian matter or something else, unless the argument demands such attention. These general considerations about the role of substance in various contexts lead the young Leibniz (especially during the 1670s) to speculate about the existence and nature of material substances and how to explain their unity. Since he is, in those years, only limited in scope by very general assumptions, there is a wide variety of different explanations concerning the

[4] 'System of Nature' (1695), G VI 482/AG 142.
[5] See, e.g., Daniel Garber, *Leibniz. Body, Substance, Monad* (Oxford: Oxford University Press, 2009) and Catherine Wilson, *Leibniz's Metaphysics: A Historical and Comparative Study* (Princeton: Princeton University Press, 1989).
[6] See, e.g., Robert Merrihew Adams, *Leibniz: Determinist, Theist, Idealist* (Oxford: Oxford University Press, 1994) and Christia Mercer, *Leibniz's Metaphysics: Its Origins and Development* (Cambridge: Cambridge University Press, 2001).
[7] 'Simple substances' appear for the first time in the unpublished 'Remarques sur les Objections de M. Foucher' (1695): "[I]n actual substantial things, the whole is a result or coming together of simple substances, or rather of a multitude of real unities." (G IV 491/AG 146.)

constitution of the continuum and how continuous bodies cohere available to him, and he takes ample room for experimenting with these options, despite some of them being incompatible with each other.[8] But there is a more general concern that all these approaches and solutions have in common, namely how to account for the unity of corporeal substances. After realizing that there are no continuous bodies in nature and that the solution to the problem of the continuum does therefore not deliver an explanation for the coherence of composed or aggregated things, Leibniz shifts his focus back onto substantial forms as a principle not only of unity, but also of indivisibility. By the time of the *Discourse on Metaphysics* (1686), it is the "indivisible forms or natures"[9] that cause in some way the unity of substance. The indivisibility in the context of the *Discourse* and the following correspondence with the Jansenist Antoine Arnauld is closely connected with another feature of substance that Leibniz develops in those years (even though it clearly has Aristotelian roots), namely the impredicability of substance. And all these various concerns, driven by the wish to explain the phenomena of seemingly active and unified corporeal things we encounter in the world– hence all these considerations about activity, unity, indivisibility and impredicability – finally culminate in the notion of simplicity.

Within this overall development, several different areas of science and philosophy have taken influence on Leibniz considerations. There is, obviously, an overarching *metaphysical strand*, which tries to capture a notion of substance that is in accordance with the requirements imposed by other, more specific strands. But the being in place of such an encompassing metaphysics does not require a subscription to the general claim that metaphysics is always, especially in the context of discovery and experience, prior. It is rather the case that some of the demands placed on the notion of substance originate from Leibniz's reflections on *physics*, which guide his thinking from very early on, but possibly the most metaphysically important moment for the undertaking at hand is his introduction of the notion of force, which will be intimately connected with the notion of substance:

[8] The most extensive treatments of Leibniz's views concerning the continuum up to the 1680s can be found in the writings of Richard T. W. Arthur, especially his 'Introduction' to RA, and Philip Beeley's *Kontinuität und Mechanismus. Zur Philosophie des jungen Leibniz in ihrem ideengeschichtlichen Kontext*. (Stuttgart: Franz Steiner Verlag, 1996 [= Studia Leibnitiana Supplementa Vol. 30.]).
[9] 'Discourse on Metaphysics' (1686) §18, G IV 444/AG 52.

> [T]he concept of *forces* or *powers*, which the Germans call *Kraft* and the French *la force*, and for whose explanation I have set up a distinct science of *dynamics*, brings the strongest light to bear upon our understanding of the true concept of *substance*.[10]

This is no surprise since Leibniz entertains the idea that metaphysics is required in order to ground key notions of physics throughout his philosophical career.[11] But physics is by no means the only area that influenced his ideas on the notion of substance. Equally important are *theological considerations*, most importantly for the concern at hand is the simplicity of God and thus the hierarchy of monads or the similarity of monads with God: "[...] God alone is the primitive unity or the first [*originaire*] simple substance [...]"[12] In Leibniz we find "a general top-down theory of the *constitution* (and not just the causation) of the constitutive properties, or *realities*, of finite things as deriving their positive content from those of the infinite being"[13]. If substances are similar to God in the sense that their positive properties are derived from God's perfection, there might be a *prima facie* obvious way leading from a simple God to simple substances. But even if the positive content of a created substance is derived from God, it is less clear how one might account for limitation without adding anything and therefore risking the created substance to turn out to be complex and composed of distinct parts rather than genuinely simple.

Part of the answer to what we should regard and not regard as partless, i.e. simple, can also be found in Leibniz's *mathematical writings*. First and foremost it is mereology that occupies itself with the notions of parts and wholes and will thus give clues as to how to understand terms crucially involved in the definition of 'simplicity'. But there is another reason why mathematical insights prove fruitful for the

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[10] 'On the Correction of Metaphysics and the Concept of Substance' (1694): G IV 469/L 433.

[11] It seems to be another feature common to Leibniz's considerations throughout the years that physics itself is incapable of explaining the activity of physical objects, though these reflections are first coined in terms of motion and only later on in terms of force. But at any stage of this development matter must be supplied with some substantial form or active principle in order to account for the phenomena we experience on a daily basis and that physics aims at describing. We will see later, in chapter 3.2. on the correspondence with De Volder, that things are a bit more difficult. Despite the claim that metaphysics grounds physics, we will see there one of the more explicit cases where Leibniz claims that physics is in a certain sense epistemologically prior or 'the gate to' metaphysics. But we will look at this claim in due course.

[12] 'Monadology' (1714) §47, G VI 641/AG 219.

[13] Robert Merrihew Adams, "The Priority of the Perfect in the Philosophical Theology of the Continental Rationalists," in *Rationalism, Platonism and God*, ed. Michael Ayers (Oxford: Oxford University Press, 2007), 103.

illumination of 'simplicity': Leibniz often feels the need to resort to mathematics in order to build analogies with what he has in mind concerning the notion of a simple substance:

> We could call them [i.e. real unities] *metaphysical points*: they have *something vital*, a kind of *perception*, and *mathematical points* are the *points of view* from which they express the universe. [...] [M]athematical points are exact, but they are mere modalities. Only metaphysical points or points of substance (constituted by forms and souls) are exact and real [...][14]

It allows him, in addition, to unite the notion of a simple substance with the idea of a representation of a manifold of perceptions or the possession of a variety of different modifications:

> [...] the simplicity of a substance does not prevent the plurality of modifications which must necessarily be found together in the same simple substance; and these modifications must consist in the variety of relations [rapport] which the substance has with things outside. In the same way there may be found, in one centre or point, though it is perfectly simple, an infinity of angles formed by lines which meet in it.[15]

But it is not only their position as a point of view and their ability to unify an infinity of perspectives that suggest mathematical points as a suitable and illuminating analogy. Leibniz, furthermore, employs mathematical ideas in order to explain how those simple unextended substances can enter into extended composite objects:

> One must not infer that the indivisible substance enters into the composition of body as a part, but rather as an essential, internal requisite, just as one grants that a point is not a part that makes up a line, but rather something heterogeneous which is, nevertheless, necessarily required for the line to be and to be understood.[16]

This manifold of modifications might not arise from Leibniz's attempt's to supply his epistemological views and the phenomena we perceive with a metaphysical underpinning, but it is illuminated by considering them. These reflections are not only connected with simplicity by possibly posing a problem for it, namely the introduction

[14] 'New System' (1695), G IV.483/AG 142.
[15] 'Principles of Nature and Grace' (1714) §2: G VI 598/AG 207.
[16] 'Notes on Fardella' (1690), A VI iv 1669/AG 103.

of a multiplicity into a simple substance, but they are also related to the notion of force and the active character of substance:

> But if we take 'action' to be an endeavour towards perfection, and 'passion' to be the opposite, then genuine substances are active only when their perceptions (for I grant perceptions to all of them) are becoming better developed and more distinct, just as they are passive only when their perceptions are becoming more confused.[17]

We see here a close connection between forces that are the dominant subject of Leibnizian physics, confused and clear perceptions, and perfection, which are all ultimately united in the metaphysical determination of what it is to be a thing that can be the subject of all these aspects: a simple substance.

In addition, there are several years worth of thought leading up to the introduction of simple substances, in which Leibniz emphasized a conception of substance that had primarily its logical properties in view. This *logical strand* concerning the impredicability and role of being the ultimate subject of predication will also prove important for the development of simple substances.

Once the development has been laid out, the possible intension of 'simplicity' becomes not only richer in content, but also more restricted in application. This provides in return further means to explain the constitution of simple substances.

Now what seems quite puzzling is the fact that the notion of matter keeps popping up in Leibniz's philosophy, also in the monadological writings[18]. The main question is, if and how matter can be at all belong to a simple substance. One way to go would be to rely heavily on the epistemological branch and ascribe a phenomenalism concerning matter to Leibniz. Matter, then, is just an appearance, though an ordered one, since its perception is pre-regulated by the perceptual harmony between things. This solution is indeed suggested in some of Leibniz's writings, but it sits uneasily with the developmental story and the various strands entering into it, since it neglects the fact, among other worries, that the notion of substance is supposed to ground physics

[17] *New Essays Concerning Human Understanding* (1704) II.xxi.72, NE 210.
[18] I adopt the strategy of referring to Leibniz's writings that explicitly include monads as fundamental constituents as 'monadological', while the name giving text is referred to as the *Monadology*.

as well. One might want, so to say, a matter more 'real' than just a phenomenon.[19] Another option is to claim that matter and form are united into one substance in a way that a monad is indeed a corporeal substance.[20] But how would a substantial form achieve the required unification and is the resulting unity strong enough to establish genuine simplicity? Surely, a unification merely by means of perception seems too little to establish a genuine unity consisting of two drastically different constituents. But is there another option given by Leibniz?

The following proposed 'functionalist' reading of form and matter tries to a certain extent to postpone the analysis of the ontological status of matter. It focuses more on the explanatory work it does and less on the ontological correlata they might have. Using the terms 'matter' and 'form' as explanatory principles for certain substantial features can already be found in Aquinas (even though he uses these terms also as metaphysical constituents – but these two uses do not always coincide). Leibniz seems to employ form and matter in a similar way: Matter is what accounts for the resistance, passivity, and limitation of a substance. This take on matter also explains why creatures, which are necessarily limited in their being and perception, are not perfectly moral, and why resisting can never happen without 'body' – which is a further core notion that is in need of additional analysis. If Leibniz did not employ a functionalist notion of matter, it remains rather unclear why he would claim that form, and therefore also the soul, can never be without matter at the time of the monadological system with mind-like substances as its fundamental ontological constituents, instead of keeping in line with the orthodox view which claims the soul can exist independently of the body in order to secure its immortality. The answer suggested in the following is relatively simple: Because it is matter that limits substances, therefore a substance can never be without matter, unless it is an unlimited substance free of all matter, i.e. God. Matter seen in this way is defined in a purely negative way: it is privation or negation and

[19] For a discussion concerning the compatibility of substance idealism, i.e. the assumption that the fundamental ontological constituents are monads, with a kind of 'matter realism', the assumption that matter can exist independently of being perceived by a mind, see Donald Rutherford, "Leibniz as Idealist," *Oxford Studies in Early Modern Philosophy* 4 (2008).

[20] As proposed for example by Pauline Phemister, *Leibniz and the Natural World: Activity, Passivity and Corporeal Substances in Leibniz's Philosophy* (Dordrecht: Springer, 2005). This view is also proposed as being one part of a set of options held by Leibniz in Glenn Hartz, *Leibniz's Final System. Monads, Matter, and Animals* (London, New York: Routledge, 2006), who argues that Leibniz's ontological commitment has to be determined on a case-to-case basis.

therefore also does not add anything to the created substance. In the 'Dialogue effectif' from 1695, Leibniz equates imperfection and negation by stating that all created things "are bounded or imperfect by virtue of the principle of negation or of nothingness they contain, by virtue of the lack of an infinity of perfections in them"[21]

Such an account of matter, firstly, is in accordance with the description of the constitution of substance as given in the correspondence with De Volder:

> I therefore distinguish: (1) the primitive entelechy, i.e., soul; (2) matter, namely, primary matter, i.e., primitive passive power; (3) the monad completed by these two things [*Monada his duabas completam*]; (4) the mass [*massa*], i.e., the secondary matter, i.e., the organic machine, for which innumerable subordinate monads come together; and (5) the animal, i.e., the corporeal substance, which the monad dominating in the machine makes one.[22]

This passage prima facie suggests a composition of a monad out of a formal and a material aspect, and a realistic view on corporeal substances. But on the reading proposed here we are not forced to regard the individual steps from (1) to (3) as treating different things, but distinctions the mind can make when looking at a substance. If (2) primary matter is in itself nothing and not really distinct from (1) entelechy, the former does not add anything to the latter when one takes (3) the complete monad into view. And as (4) secondary matter is essentially derived from the coming together of (3) monads, it does not seem to constitute a substantial part either but merely an *ens per aggregationem*. Whether or not (5) has to be regarded, speaking in metaphysically strictly terms, as a different kind of substance will be part of the following debate.

But this reading points to another issue worth addressing. If this reasoning is correct, it will turn out to be highly questionable, if not impossible, to assign Leibniz a camp within the materialism-immaterialism distinction. For Leibniz, matter matters, it is an important principle that accounts for a variety of phenomena, despite the fact that in the case of primary matter it is in itself nothing positive – the case of secondary matter,

[21] 'Dialogue on Human Freedom and the Origin of Evil' (1695), Gr 364/AG 114; see also 'Discourse on Metaphysics' (1686) §30: "And it is to this [i.e. an original imperfection or limitation connatural to all creatures], in my view, that we must reduce the opinion of Saint Augustine and other authors, the opinion that the root of evil is in nothingness, that is to say, in the privation or limitation of creatures" (G IV 455/AG 62).
[22] To De Volder, 20 June 1703, LDV 265.

as we will see, is a less straightforward case, but it is equally important. In this sense, one might be reluctant to call him either a materialist or an immaterialist.

The answer to why Leibniz introduces simplicity seems clear: it is the most economic way of putting things, it captures all other features that are essential to substance and it does so apparently better than indivisibility and unity would do, since what has no parts cannot be divisible and is necessarily a unity. But this simplicity also crucially hints at a certain type of substantial composition that is in accordance with the partlessness of substances: While a substance consists of matter and form, the former amounts to nothing, i.e. it is not an ontologically positive constituent, not even an incomplete one. Primary matter as negation, limitation, or privation does not only preserve the substance's simplicity, but it also features in the accounts of phenomena in a variety of fields, such as metaphysical evil (with the positive effect that as negation it would not be something created by God), epistemic confusion, physical resistance, etc. The notion of simplicity allows Leibniz to concentrate an array of conceptions and explanations onto the idea of an active substance.[23]

[23] A similar view on primary matter is also proposed in Maria Rosa Antognazza, "Primary Matter, Primitive Passive Power, and Creaturely Limitation in Leibniz," *Studia Leibnitiana: Leibniz et les Scolastiques*, ed. Arnaud Pelletier (forthcoming) and Shane Duarte, "Leibniz and Prime Matter," *Journal of the History of Philosophy* 53.3 (forthcoming). Both are connecting the notion of primary matter as privation or non-being with Scholastic predecessors, Antognazza with the discussion concerning the status of primary matter between Thomas Aquinas and Duns Scotus, Duarte with issues concerning universal hylomorphism, predominantly in Bonaventure, and Aquinas.

1. Background: Some Scholastic Heritage and Leibniz's Early Formative Years

1.1. Scholastic Legacy: A Thomistic Explanatory Framework

Recollecting late in his life the steps in his philosophical development, Leibniz described his ways of thinking in a well-known passage from a letter to Nicolas Rémond in the following way:

> I discovered Aristotle as a lad, and even the Scholastics did not repel me; even now I do not regret this. But then Plato too, and Plotinus, gave me some satisfaction, not to mention other ancient thinkers whom I consulted later. After finishing the trivial schools, I fell upon the moderns, and I recall walking in a grove on the outskirts of Leipzig called the Rosental, at the age of fifteen, and deliberating whether to preserve substantial forms or not. Mechanism finally prevailed and led me to apply myself to mathematics. It is true that I did not penetrate into its depths until after some conversations with Mr. Huygens in Paris. But when I looked for the ultimate reasons for mechanism, and even for the laws of motion, I was greatly surprised to see that they could not be found in mathematics but that I should have to return to metaphysics. This led me back to entelechies, and from the material to the formal, and at last brought me to understand after many corrections and forward steps in my thinking, that monads or simple substances are the only true substances and that material things are only phenomena, though well founded and well connected.[24]

Given that we have such a seemingly clear description at hand it is not surprising that it has been widely acknowledged that Scholastic philosophy had a tremendous influence on Leibniz's thinking. But there is hardly any consensus among commentators about the exact extent of this influence or when and in what way Leibniz emancipates himself from it at various stages of his life. Leibniz himself does not give any detailed information about or reasons for this alleged development from Scholastic philosophy to mechanism and mathematics and back again. The cited passage by itself indeed does not even establish a sufficiently

[24] Leibniz to Rémond, 10 January 1714, G III 606/L 654-5.

strong basis for the assumption that the development Leibniz considers himself to have gone through is a fundamental change of mind and theory. It might equally well be just a description of a shift in emphasis, a change from an interest in Scholastic philosophy to physical and mathematical problems and back to metaphysics again.[25] But it is, in addition, not even clear which Scholastic philosophers had a lasting influence on Leibniz. Some commentators have recognized a strong influence of the philosophy of Francisco Suárez,[26] especially of his nominalism, while others have felt it to be more appropriate to ascribe to him a rather Scotist position concerning some crucial issues[27]. It is, in general, difficult to evaluate the concrete influence of individual thinkers on Leibniz, given that any such ascription is premised on a certain interpretation of his philosophical position. But one way or another, it seems clear that there has been some kind of influence by the preceding tradition (also by Leibniz's own admission) and bringing this tradition into relation with the problems that concern us in the following might turn out to cast light onto the issues we are dealing with here. And though we will return to Scotus below, we shall first take a slightly less orthodox look at a tradition that has been considered significantly less often, at least explicitly, namely the metaphysics of Thomas Aquinas.

One might with some right claim that there are interpretations of Leibniz's philosophy which seem to (at least implicitly) cover a potential Thomistic influence, namely all those ascribing some Aristotelian hylomorphism to Leibniz.[28] Aquinas is, after all, an important protagonist in the medieval Aristotelian tradition. But there

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[25] Especially the age of fifteen seems too early for a change towards mechanism, his *Disputatio* of 1663 is clearly a rather Scholastic piece of work, which is unsurprising given the affinity of his teachers Thomasius and Scherzer towards Aristotle and Plato, but also considering their bias against the new mechanical philosophy. See Christia Mercer, "The Young Leibniz and his Teachers," in *The Young Leibniz and His Philosophy (1646-76)*, ed. Stuart Brown (Dordrecht: Springer, 1999) and her *Leibniz's Metaphysics. Its Origins and Development* (Cambridge: Cambridge University Press, 2001), 27-38.

[26] See, e.g., Laurence B. McCullough, "Leibniz and Traditional Philosophy," *Studia Leibnitiana* 10.2 (1978), 254-270. For a more critical evaluation, see Andre Robinet, "Suárez im Werk von Leibniz," *Studia Leibnitiana* 13.1 (1981), 76-96.

[27] See, e.g., Roger Ariew, "Descartes and Leibniz as Readers of Suárez: Theory of Distinctions and Principle of Individuation," in *The Philosophy of Francisco Suárez*, ed. Benjamin Hill and Henrik Lagerlund (Oxford: Oxford University Press, 2012), 46-58.

[28] Most prominently Daniel Garber, "Leibniz and the Foundations of Physics: The Middle Years," in *The Natural Philosophy of Leibniz*, ed. Kathleen Okruhlik and James Robert Brown (Dordrecht: Reidel, 1985), 27-130 and his *Leibniz. Body, Substance, Monad.* I might also consider Pauline Phemister's *Leibniz and the Natural World* to fall into this category of interpreters, even though in a very different, less straightforwardly Aristotelian way.

are several reasons to look at Aquinas rather than at his Greek ancestor. First of all, Leibniz points several times in a positive way specifically to Thomas Aquinas, most prominently in his account of substance in the *Discourse on Metaphysics* and elsewhere:

> [I]t is not true that two substances can resemble each other completely and differ only in number [*solo numero*], and that what Saint Thomas asserts on this point about angels or intelligences (that here every individual is a lowest species) is true of all substances…[29]

References like this usually do not receive much attention as it seems to be assumed that Leibniz's claim here merely is that the fact that Aquinas considered each angel to constitute its own lowest species is true of all substances, and that he, Leibniz, happens to share this view. Aquinas's reason for the assumption that each angel is its own lowest species is based on its lack of matter as a principle of individuation: "There can be many members of a species only because matter individuates the species form to make it this individual substance. Since the angels are pure forms without matter, each angel differs in kind or species from every other angel."[30] But there is the possibility that he wanted to indicate more with this reference, namely that something of the general *constitution* of Thomistic angels is also applicable to all individual substances, and it would be this constitution that grounds the further claim that each created individual is a lowest species. But at the moment, this is only a possibility, which I will explore further in a moment. Let us first consider other reasons that might make a look at Aquinas preferable to one at Aristotle.

In addition to the frequent positive references, there are several important issues that both Leibniz and Aquinas feel the need to account for, but these are issues that are alien to Aristotle, since they are connected with certain theological

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[29] 'Discourse on Metaphysics' (1686) §9, G IV 433/AG 41-2. Or similarly in 'Primary Truths' (1689):"[I]n nature, there cannot be two individual things that differ in number alone. For it certainly must be possible to explain why they are different, and that explanation must derive from some difference they contain. And so what St. Thomas recognized concerning separated intelligences, which, he said, never differ by number alone, must also be said of other things, for never do we find two eggs or two leaves or two blades of grass in a garden that are perfectly similar." (C 519/AG 32)

[30] Brian J. Shanley, *The Hackett Aquinas: The Treatise on the Divine Nature: Summa Theologiae I 1-13*, transl., with commentary, by Brian J. Shanley, O.P., introd. by Robert Pasnau (Indianpolis: Hackett, 2006), 286.

assumptions or constraints, such as creation, the simplicity and nature of God, or the immortality of the soul. Concerning the latter, Leibniz explicitly allies with Aquinas:

> I grant that the substantial form of the body is indivisible, and it seems to me that this is also Saint Thomas's opinion; and I further grant that every substantial form or, indeed, every substance is indestructible and even ingenerable…[31]

Not only these scattered positive references and shared interests, but also Leibniz's persistent use of the notions of form and matter throughout his life should justify the effort of taking a closer look to see if Aquinas's metaphysical system might provide some insight into Leibniz's own theory.

Like Aristotle in his *Metaphysics*, Aquinas takes some kind of familiarity with what types of things count as 'substances' for granted and as a starting point for further investigation. Those individual things we have some kind of familiarity with, i.e. humans, horses, etc. (or better: this human Socrates, the horse Bucephalus, and so on, since for him, as well as for Aristotle, what is a substance is always an individual, particular substance), are hylomorphic compounds, that is, compounds of matter and form. The first component of this compound, matter, is that which can have a form and which is potentiality, while the second component, form, is that which can be had by matter and which is actuality. Only together do they compose a persisting individual material substance of a certain kind, e.g. a horse, a human, and so on. Matter, as a constituent of actual corporeal individuals, is 'signate matter', i.e. "matter which is considered under determinate dimensions"[32], and it is at the same time also the principle of individuation of this material substance.[33] It is matter in this sense that explains why a being which is partly constituted of it is a *material* (or *corporeal*) object, such that the matter, bones and flesh of Socrates, explain why he is a *material* being, while his soul or substantial form explains why he is a *human* being. It seems obvious, at least for Aquinas, that

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[31] To Arnauld, 28 November/8 December 1686, G II 75/AG 78.

[32] Thomas Aquinas, *Basic Works*, ed. Jeffrey Hause and Robert Pasnau (Indianapolis: Hackett, 2014), 17. For a critical discussion of 'signate matter', see Christopher Hughes, *Aquinas on Being, Goodness, and God* (London and New York: Routledge, 2015), 74-109.

[33] Thomas Aquinas, *Summa Theologia*, transl. Fathers of the English Dominican Province (London: Burns, Oates and Washbourne, 1911), I, qu. 75, art. 4: "[S]ignate matter […] is the principle of individuality […]. For as it belongs to the notion of this particular man to be composed of this soul, of this flesh, and of these bones".

this type of matter cannot be part of the composition of an angel[34] or any other incorporeal being. Slightly different is the situation concerning the human soul, which, even though it is naturally the form of some matter, can be, like angels in general, without such matter after the death of the corporeal human being (i.e. after the separation of signate matter and substantial form), even though only as incomplete[35]. This is the use of 'form' and 'matter' in the sense of ontological components of corporeal beings, a use that I would refer to as 'substantial', and which mirrors the use of these terms found in Aristotle.

But form and matter are in the Thomistic framework not only basic constituents of material substances, they are also principles relevant to the explanation of several qualities observed in substances, one of the most important ones among them being change. This notion of change –borrowed from Aristotle and so far still in agreement with him – covers more than we might connect with it, but there is a rather simple general scheme underlying all change as Aquinas sees it: Something persists while something else connected with it changes.

Hence there are two elements in each change, that is, in a temporal succession of two things which differ in some respect. In the case of substantial change, i.e. in the case of the corruption of one substance and the generation of another, what passes and is replaced by something else is a substantial form. In the case of the death of, say, Socrates the substantial form of Socrates, i.e. his soul, is replaced by the substantial form of the corpse, resulting in a material object that can only equivocally be called 'Socrates' body' or even 'human body'. But there is a more common kind of change, the one we encounter around us all the time, namely accidental change. Here an accidental form goes out of being and is replaced by a different accidental form, as happens when the still living Socrates enjoys the sunshine and changes from being pale to being tanned. In all cases of change there is also always some thing which remains or persists throughout the changing of the respective kinds of forms, i.e. a thing that is changed or underlies the change, which is called 'matter'. Here we find another general division of a thing into form and matter, but in a different sense than in the substantial sense

[34] See Aquinas, *Summa Theologia* I, qu. 50, art. 1 & 2.
[35] ibid., qu. 75, art. 4.

that applies to the hylomorphic composition of corporeal substances and which is not coextensive with it.

We are, in this way, able to identify two different notions of 'form' and 'matter' in Aquinas: In a substantial sense we find (first and foremost substantial) form and matter to be the constituents of any material thing that qualifies as a substance. But we also find 'form' and 'matter' as used with respect to fulfilling a certain *function* in the explanation of how change takes place, and in this sense they are not coextensive with form and matter that are found to be the constituents of the corporeal composite substance. Phrased generally, matter in the functional sense is whatever it is that persists throughout change and, due to there being two different types of change, this 'matter' can and has to refer to different things in different kinds of change. In substantial change it is prime matter that constitutes the persisting component, as that which remains when the soul is substituted by the form of the corpse in the case of death. In accidental change, on the other hand, it is the whole substance, i.e. in the case of a corporeal substance it is the whole compound of substantial form and matter that persists and forms the matter of an accidental change. It is the form-matter-composite that is Socrates which remains and forms the basis for the change from pale to tanned when Socrates is spending time in the sun. Put in simpler terms: Since there are two different kinds of forms, substantial and accidental forms, there are two forms of change, one corresponding to each form. In the first case it is substantial form that goes out of being while another substantial form takes its place, while in the case of accidental change it is some accidental form of an individual substance that is being replaced by another.

But some kind of change, because its definition is deliberately broad and is supposed to account for such a vast variety of cases, surely occurs in spiritual substances as well and we should, therefore, expect to find some kind of matter (in its function as an element in change, though not as a component of a corporeal substance) in them too. It might not be the kind of change of visible properties that we find when Socrates is tanning, but they nonetheless change insofar as they change place and gain knowledge.[36] Aquinas himself did see the need to ascribe some kind of change to angels and hence the need to account for this change. He

[36] ibid., qu.10, art. 5, resp.

goes about this by distinguishing matter in a 'proper and generally accepted' sense, which I have been calling 'substantial', from matter as it is used in the explanation of change. In the case of the former,

> the term "prime matter" is generally used to mean something which is in the genus of substance as a kind of potency, which is understood as excluding every species and form, and even as excluding privation, and yet is a potency capable of receiving both forms and privations […] Now if matter be taken in this sense, which is its proper and generally accepted meaning, it is impossible for matter to be in spiritual substances.[37]

Here we have the notion of prime matter as pure potentiality[38], as a formless[39] mass which has only negative unity, i.e. is one due to a lack of any kind form[40], which therefore does not have the kind of unity required for substantiality and which is not a unity by itself in a positive sense.[41] While Leibniz will pick up "*primary matter* in the schools, if correctly interpreted"[42] in order to illustrate the fundamental constitution of his notion of substance, it will not be the notion of a formless mass that is the fundamental substratum which is actualized by form that he picks up. This notion of matter as something akin to a bare substratum is, rather, a notion of matter Leibniz already criticises in his younger years.

But in contrast to the 'proper', substantial notion of matter, Aquinas also recognizes that there is also the important functional role matter plays and "if we use the terms 'matter' and 'form' to mean any two things which are related to each other as potency and act, there is no difficulty in saying (so as to avoid a mere dispute about words) that matter and form exist in spiritual substances"[43]. Here Aquinas explicitly acknowledges that there is such a thing as matter in immaterial substances, even if it is not the kind of matter we primarily think of when we use the term. But we can find several other important functions that such a 'matter'

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[37] Thomas Aquinas, *On Spiritual Creatures* (*Quaestio disputata De spiritualibus creaturis*), trans. M. C. Fitzpatrick and J. J. Wellmuth (Milwaukee: Marquette University Press, 1949), art. 1, resp.
[38] Aquinas, *Summa Theologia* I qu.77, art. 1, ad. 2.
[39] ibid., qu.47, art. 1, c.
[40] Thomas Aquinas, *Basic Works*, 20.
[41] It should be noted that there is not a univocal use of the term 'prime matter' in Leibniz's writings, we find, for example, a different notion criticized in 'De prima materia' (1670—1671 (?)), A VI ii 279-80, where the objections there are aimed at Aristotle and Cartesian 'subtle matter'.
[42] 'Specimen Dynamicum', GM VI 237/AG 120.
[43] Aquinas, *On Spiritual Creatures*, art. 1, resp.

fulfils in Aquinas's system, which surely are not restricted to corporeal substances either. One of them is, for example, its being the principle of passivity[44]. Aquinas himself seems to deny that the passivity, which is indeed also found in angels, requires matter, but that "a created spiritual substance is active and passive, not in consequence of form or matter, but according as it is in act or in potency"[45]. What he seems to have in mind here is that spiritual substances do not require matter in the substantial sense, but given that act-potency-relations can be spelled out as form-matter-relations, we could in this case refer to that which accounts for the passivity in spiritual substances nonetheless as being brought about as a function of some 'matter'. What requires that all created substances have matter in the sense of potency is the presupposition that all creatures are, in contrast to their creator, necessarily limited and not purely active. Thus we find in Aquinas a way in which we can ascribe 'matter' to all created and hence limited substances in a functional sense, in their role in the description of the general constitution of creatures and in serving as a general explanatory principle, independent of the substances in question being material or immaterial. In this way it is also possible to ascribe matter (in a functionalist sense, though not in the substantial one) to purely spiritual substances, but without being committed to ascribing any corporeality to them. This ascription of certain limiting or passive principles alongside active principles or forms by itself does not require any commitment to further specified kinds of substances and can hence be applied to all substances that fulfil the criterion of limitation and passivity, which would be – for Aquinas, but also, as we will see, for Leibniz – all created substances.

This distinction between a substantial and functionalist account of form and matter can be illustrated by a certain view held by Aquinas, which *prima facie* is at odds with his overall Aristotelian metaphysics. In Aristotle it seems to be clear that in the cases in which a substantial form and some matter are the constituents that enter into the constitution of a particular corporeal individual, the form is the form *of* some matter and thus it cannot be without it. There does not seem to be any space for a human soul existing independently of or prior to the human body

[44] ibid., art 1, obj. 16: "nothing is active and passive on the same basis, but each thing is active through its form, whereas it is passive through its matter".
[45] ibid., art 1, resp.

of which it is the form, and the body is – properly speaking – only a human body as long as it is actualized by a human form, i.e. a soul. For Aquinas, who adopts the notion of the human soul as being essentially associated with a particular body, this brings about a certain conflict, because it seems to jeopardise the immortality of the soul. Any defence of immortality within this hylomorphic account of the human constitution seems to require that a human soul can be without a human body, at least for some time until they are reunited, since Aristotle is explicit that death or corruption is the separation of a substantial form from its matter. Aquinas acknowledges this difficulty and tries ease the tension by allowing the soul, although it is naturally the form of a body, to be without this body, even though only as an incomplete substance. But this problem arises only under the consideration of form and matter as ontological, positive, distinct constituents of material substances. It does not seem to be an immediate consequence of the functionalist view of matter and form, where matter as a principle of passivity and limitation, on the contrary, is even required to remain a constituent of the substance, lest substances should turn into purely active (and hence godlike) beings after their death. But it does not require that the body usually or naturally associated with the substance remains, since – within the functionalist framework – no decision has been made as to whether such bodies exist at all. It is possible that it is a view of matter similar to the functionalist one proposed here that Leibniz has in mind when he claims that no created substantial form (including that of an angel) could ever be without matter, also when considering its constitution after death.[46] A similar view might also be ascribed to Aquinas's souls after death: If they still undergo any change, they must have some matter. And if we emphasise the sense of 'matter' as an explanatory principle which accounts first and foremost for certain functions such as limitation and passivity, then we must surely understand all created substances to be composed of form and matter, even if they are not 'corporeal' in a workaday sense.

[46] An early hint at this theory might already be found in the Correspondence with Arnauld: "[O]ne will easily convince oneself that corruption or death is nothing other than the diminution and envelopment of an animal which nevertheless goes on surviving and remaining alive and organic" (G II 123/LA 157). But at this moment, this amounts only to a tentative hint, at least until we have taken a closer look at this correspondence in the next chapter.

This distinction will prove relevant for further considerations about the nature of substance, especially in the case of Leibniz. We will see that throughout his philosophical writings, form and matter play an important role in his accounts of the constitution of substance, and often this usage has been regarded as involving several dramatic shifts over what these notions amount to. But the functional reading emphasizes an overall narrative that makes plausible the development from early considerations about cohesion and the continuum via the introduction of complete concepts to a culmination in simple substances. This development is driven by the search for an explanation of the unity and activity by which each substance is necessarily characterised, but it also incorporates an explanation of the essential limitation and passivity of creatures. While under a substantial reading of these notions, the claim of radical shifts in Leibniz's metaphysics seems to be indeed suggested (even though it is still a matter of discussion as to when and to what extent these shifts take place), through the eyes of a functionalist reading, we find a unifying and unified train of thought. This latter reading also takes into account an aspect fundamental to unity and problematic on the substantial reading: The question of the relation between form and matter that allows them to form an individual substance. Depending on how strong the notion of unity is taken to be, there is a problem in the distinction between form and matter as two distinct components of one substance. If strict unity should turn out to involve the idea of inseparability of parts, it might be asked whether being united naturally – as Aristotelians would view the relation between form and matter in corporeal individuals – is sufficient. This question seems even more pressing in Aquinas, who in fact allows for a substantial form to exist independently of matter, even if only as an incomplete being. But a functionalist reading of form and matter does not by itself involve a commitment to there being two principles independent of each other and several passages in Leibniz will suggest that they are not indeed related to each other as two different components or parts of one thing. Rather they are one thing, that is, there is only a created substance, viewed under two different aspects. In this way the real unity that is a substance is ontologically prior to its active and passive constituent, in a way that is best captured by the notion of simplicity, since this allows for unity in the strictest

sense. And it is unity that consistently plays an important role in Leibniz's considerations concerning the notion of substance.

1.2. Leibniz's Early Years

1.2.1. Fundamental Principles of Substantiality

When it comes to Scholastic heritage in Leibniz, his *Disputatio de principio individui*[47], written in 1663, is an obvious place to start. There are several reasons why this text is of interest. First, for systematic reasons, it should be noted that it was published with a preface by Leibniz's teacher Jakob Thomasius, in which he "presented Aristotle's doctrine regarding individuals as a distinction between 'monadic' and 'sporadic' individuals. A monadic individual […] constituted a species on its own (such as, in Thomas Aquinas's interpretation, each angel), whereas a sporadic individual was just one of the many individuals embraced by the same species."[48] Though it is clear that the monadological account is by no means present yet, it is remarkable that Leibniz's later monads will each constitute their own species as well. But one must keep in mind that the *Disputatio* itself was written for the particular academic purpose of being awarded the degree of a bachelor by the not yet 17-year-old Leibniz, and therefore not everybody is convinced that this writing should be taken as an important piece for the interpretation of Leibniz's philosophy. We are indeed warned that "the Scholastic arguments of the *Disputatio* are taken sometimes too seriously at their face value by interpreters."[49]

But even if several parts of this thesis seem to be not much more than an exhibition of the vast knowledge gained during his philosophical studies (and, according to his own testimony, it seems some of it was gained already in his childhood), it is nonetheless the first philosophical writing by Leibniz available to

[47] 'Disputatio metaphysica de principio individui' (1663), G IV 15-26.
[48] Maria Rosa Antognazza, *Leibniz. An Intellectual Biography* (Cambridge: Cambridge University Press, 2009), 57.
[49] Stefano Di Bella, *The Science of the Individual: Leibniz's Ontology of Individual Substance* (Dordrecht: Springer, 2005), 25.

us and it is remarkable that he already in those early years lays down several important decisions about what a principle of individuation should be, even if some of the details might change over time: What Leibniz is looking for is "something real or what is called a physical principle that can serve as the foundation for the formal notion of individual in the mind"[50], which is an internal principle of being (and not primarily one of knowing). Leibniz seems in general hesitant to admit that we can decide with certainty whether any individual we encounter in experience, apart from ourselves, is indeed a unified substance, i.e. if it is one body rather than many. But he is consistently clear about one aspect concerning the core of substance as a being, namely, that it must be a being which has unity. It seems thus that the intension of the concept 'substance', though the number of criteria involved increases over the years alongside the rigour with which they are interpreted, is regarded by him to be less contentious and problematic.[51] But what falls within its extension seems to be a more puzzling question, and especially during the early years Leibniz seems to be keen on finding a way to leave open the possibility that the corporeal things we encounter in our daily lives be part of this extension, though, as far as I can see, he never seems sufficiently convinced to enter into a strong commitment to the existence of corporeal substances and the idea that they fall under the extension of 'substance'. This seems to be true about his later years as well as about what we find in the *Disputatio*.

But there are further decisions in the *Disputatio* that indicate the future path and general framework of Leibniz's thinking. The principle sought in this writing should also be applicable to all individuals, i.e. material and immaterial (created) substances (§2), and here Leibniz already sticks to his general maxim that will play a role in a wide variety of arguments throughout his life: The number of assumptions should be kept at a minimum, and an account requiring fewer principles is always to be preferred to a more complicated one, given that it can deliver the same

[50] 'Disputatio' §2, G IV 17.

[51] This does not strike me as an overly controversial claim, it has already been made explicitly by Look and Rutherford in their 'Introduction' to the Leibniz–Des Bosses correspondence (LDB xliv-xlv) and Robert C. Sleigh, Jr. *Leibniz and Arnauld: A Commentary on Their Correspondence* (New Haven: Yale University Press, 1990), 96, but it furthermore seems in accordance with the majority of interpretations.

explanatory performance. He might, in addition, already hold the assumption that there is one general notion of substance applicable to all individuals that fall under it. Leibniz does not seem to think that there are good grounds to doubt that a single principle of individuation can be found that is valid for all substances, but furthermore that its discovery does not even require to first investigate which kinds of substances there actually are. Hence the general principle of individuation does not entail an ontological commitment to the existence of corporeal and/or incorporeal substances. Here, Leibniz claims, he is departing from Thomas Aquinas, to whom he attributes more than one principle of individuation, namely 'signate' matter as the principle of individuation of corporeal substances and the whole entity in the case of intelligences (§3). But this not a straightforward rejection of Aquinas's view. Leibniz rather clears himself without further argument from the need to treat Aquinas's principles alongside all the other classical Scholastic accounts of individuation. But he agrees with one half of the twofold Thomistic doctrine, namely with the part that claims that individuals are individuated by their whole entity. And, for Aquinas, it is the individuation *qua* whole entity in the case of angels that is also the reason why each angel forms a lowest species, a claim Leibniz will later pick up as well. For both their repeated claims that certain individual substances form their own lowest species is posterior to the claim about individuation *qua* whole entity – for Aquinas systematically, for Leibniz at least considering the chronology of his development. In addition, considering that Leibniz has just claimed that Aquinas does not have a hypothesis for all individuals, he makes a surprising move in the following passage of the *Disputatio*. Instead of consequently denying that form and matter would account for individuation (as there can be only one principle, which is the whole entity), he rather claims that these cases of individuation are not opposed to the whole entity account, but that they constitute just a subordinate case of it: "For what is matter and form united except the whole entity of the composite?"[52]. What he denies here is not an account of substance in terms of form and matter (and it is, in addition, unclear in which sense he understands form and matter in this context), but that it is just one of them that functions as the principle of individuation. Strictly

[52] 'Disputatio' §4, G IV 18.

speaking, this is not necessarily a subordination of the form-matter account under the whole entity view, but rather a preference in terminology: As the theory sought in the *Disputatio* is agnostic to the question as to which kinds of substances, whether corporeal, incorporeal or both, exist, Leibniz views 'whole entity' rather than 'form' and 'matter' to be the preferable phrasing, but he clearly indicates that this is primarily a pragmatic decision rather than one founded on metaphysical grounds. (§4)[53] Hence viewing corporeal substances as being composed of form and matter is quite acceptable, but only once a case for their existence has been made – even though the principle of individuation does not demand their existence.

Even if no immediate commitment to certain types of substances has been made so far, there is a further question we need to tackle if we then want to understand in which relation matter and form in substances might stand to each other in general, because these options will narrow down possible ontological and metaphysical commitments. It is also a step that Leibniz reckons to be important to be taken in the treatment of the individuation of substance in the *Disputatio*. In the Scholastic tradition, there are in general three different kinds of distinctions: a real distinction between separable parts of one thing in the world, a distinction of reason merely made by the mind, or a formal distinction (prominently in the Scotist tradition) which has a foundation in the thing prior to the operation of the mind but without the distinguished parts being separable or even different *in re*, such that "two realities – two aspects of one thing – are formally distinct if and only if they are both really identical and susceptible to definition independently of each other."[54] In the *Disputatio* Leibniz explicitly rejects formal distinctions altogether (§24).[55] Not only are things that differ before the mind performs operations on

[53] Making such a decision seems to be a natural way of reasoning within Leibniz's thinking, considering his early appeals to the importance of clarity of words and of refraining from multiplying entities beyond necessity. (See, e.g. 'Preface to Nizolius', 1670, G IV 138-76.)
[54] Richard Cross, *Duns Scotus* (Oxford: Oxford University Press, 1999), 149.
[55] I do not see any evidence that Leibniz reintroduces the notion of formal distinctions later on, but rather that his accounts of created substances and his discussions concerned with distinctions (e.g. in his mathematical writings, but also of the continuum and part-whole-relations or even his accounts of the status of relations) suggest that there are only real and mental distinctions. There is also the further question of how Leibniz could incorporate formal distinctions, at least in the Scotist sense, at all: It seems difficult to square the Principle of Identity of Indiscernibles with the idea that there two identical res that do not share all there properties and are hence susceptible to a different definition, but that are nonetheless the same and therefore sharing all their properties. Also, it seems

them separable from each other, but there also cannot be any real composition of parts, if not all of the parts are real: "Everything that before the operation of the mind really differs from another, in a way that none is part of the other, neither wholly or partly, can be separated from the other. For in adequately different things none needs the other for its own *esse*." (§23) Or, in other words, "the only distinction on the side of the world is the real distinction"[56] between separable *res*, while "the mental or rational distinction [...] is made by the mind and does not map onto any really distinct separable *res*."[57] This does not entail that such abstractions of different aspects of one thing do not play an important role. One example of a merely mental distinction in the *Disputatio* is, possibly aside from form and matter (though it is unclear if this is not rather considered to be a real distinction by Leibniz at this moment), is that of genus and species (§22), which is for sure not a mere fiction as these concepts play an important role already for the young Leibniz in a variety of ways, including an important function in the relation between language and certain knowledge.[58]

But if there are only two ways available by which form and matter can be distinguished, at least at this moment in Leibniz's writings and thinking, can there be a real composite composed of form and matter viewed as two really distinct entities, if what has been said so far is taken into account? The answer to this is not to be found explicitly in the *Disputatio* and there are several questions that could be asked. Any inseparability of form and matter could be based either on metaphysical impossibility of separation or on the fact that they are naturally joined (akin to Thomas's view of the human soul and body). But the definition of at least prime matter, in the way it is presented by Leibniz in the *Disputatio*, seems to be one of pure potentiality. He states that "[i]f essence is purely potential, then all essences are prime matter. For two purely potential things do not differ, not even by relation

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that a formal distinction between two properties requires a certain relation to each other, which seems incompatible with Leibniz's view of relations. (For an extensive treatment of the relational properties in Leibniz see Massimo Mugnai, *Leibniz' Theory of Relations*, Stuttgart: Franz Steiner Verlag (1992) [= Studia Leibnitiana Supplementa 28].)

[56] J. A. Cover and John O'Leary-Hawthorne, *Substance and Individuation in Leibniz* (Cambridge: Cambridge University Press, 1999), 37.

[57] ibid., 36.

[58] One of the earliest examples is to be found in 'De Arte Combinatoria' (1666), where Leibniz expresses the hope that his theory of complexions will enable to find the species of things (see G IV 44).

to act, because this relation, since it would be to a being in potency, is not real."[59] (§15). This claim seems to entail the equation of pure potentiality with prime matter and to regard both of them as beings that are not real. Hence it seems as if prime matter cannot exist independently of form and, therefore, does not fulfil the criterion of either metaphysical or natural separability that is a mark of really distinct entities. And it is hard to see how this matter could be anything with positive attributes at all as it seems that every positive description requires that this prime matter is, at least in one respect, actualized by some form. In addition, this, along with his assumption that wholes can only be composed of parts that are themselves real, excludes prime matter as a part that composes, together with substantial form, a whole.

But there is a tension between this early characterization of prime matter in comparison with the notion of prime matter in a letter to Thomasius, written only a few years later. In this letter we find a different notion, not one of pure potentiality, but something akin to Cartesian *res extensa* or Thomistic 'signate matter', the latter being primary matter actualized by some form such that it occupies a threedimensional part of space.[60] We will return to this letter shortly.

Another problem that would arise from a real distinction between matter and form seems even more fundamental to Leibniz's undertaking. If matter and form could be separated, the question arises not only with respect to the composition of the whole that requires the existence of its parts, but also with respect to what it is that establishes the genuine unity of form and matter. As distinct entities they would need to be unified by some means, but it seems unclear how they can enter into one unified corporeal substance and why it should be this one corporeal thing that should be considered to be the substance, rather than its two constituents by themselves. Leibniz himself does not worry about this in the *Disputatio*, though he will do so in the years that follow afterwards.

But if there are no formal distinctions and if there cannot obtain a real distinction between form and matter, then the distinction between these two needs

[59] 'Disputatio' §15, G IV 22. I read this as implying that whatever is pure potentiality is prime matter.

[60] "Primary matter is mass itself, in which there is nothing but extension and antitypy or impenetrability. It has extension from the space which it fills." (Letter to Thomasius, April 20/30 1669, G I 17/L 95.)

to be a mental or rational one. What could it mean, then, to speak of form and matter and their difference at all? This brings us back to the different possible views on form and matter. The ontological status of and relation between matter and form expounded within the limits set by the *Disputatio*, especially the refusal to specify which kinds of substances there are, give rise to a notion of matter that is functionalist rather than substantial, in accordance with his wish not to make a commitment to particular kinds of substance. If we view 'matter' as an explanatory principle, one that also accounts for limitation and passivity, then we must surely understand all limited, created, finite things to be composed of form and matter, even though they might not have any corporeal part. Hence whatever is a created whole entity is also a form-matter compound (though the word 'compound' in this context might turn out to be not necessarily the most appropriate term).

But what does it mean to reconstruct form and matter in terms of activity and passivity or in terms of actuality and potentiality? And is there any basis for this reconstruction? In the *Disputatio*, as we have seen, Leibniz considers primary matter to be pure potentiality, which suggests something purely passive. As such it is a negation of action, but therefore also requires the action it negates to be present, since "every negation is of something positive; otherwise, there would only be verbal negation. Therefore, let there be two individuals – Socrates and Plato. Then the principle of Socrates will be the negation of Plato and the principle of Plato will be the negation of Socrates. In either case there will be something positive on which you can stand." (§12). The example here draws on the contrast between two individuals, but it might equally be applicable to an individual substance itself, given that potentiality is the absence of actuality or passivity the absence of activity. This would also explain why Leibniz equates the notions of limitation and privation with negation: they are the negation of activity, of knowledge or of a property. Leibniz also seems, in addition, to lack certain essential resources to define 'privations' in the traditional sense in which they were viewed as distinct from 'negation'. A 'privation' is a perfection that is lacking in a substance that it is should have due to being the kind of substance it is. Being blind is a privation for human being, but it is not one for a newborn cat. Later on, when Leibniz regards each individual as constituting its own lowest species and as having a complete concept, he can claim

that there cannot be any perfection that is, strictly speaking, missing from its concept and that the individual should have due to the individual it is. On the other hand, in comparison with the most perfect being, God, every perfection of a creature is falling short of the optimal or maximal case, and hence each limited perfection is also somehow privative.[61] And if we assume that there are no genuine separable parts in an individual substance, Leibniz's claim that "unity follows entity in the concept, it is the same in the thing"[62] (§20) gets a more definite sense. It is an idea Leibniz will pick up again in his correspondence with Arnauld and elsewhere: The terms unity and entity are interchangeable.[63] If the whole individual is an entity, even if we can distinguish or classify different aspects such as form and matter within it, it has essential unity. This claim does not necessarily commit to the stronger claim that the substance Leibniz has in mind here is something like a proto-monad, especially since when we talk about monads we might not only have a particular constitution of form and matter in mind, but also as something that fulfils the criteria of simplicity and mind-likeness. It is rather a more general account of the nature of substance under which, without further considerations limiting its scope, monads would fit as well as other constructions or kinds of substance. It seems nonetheless to be the case that we do find here in Leibniz's earliest philosophical writing certain principles that form a framework he will never transgress in his metaphysics of substance: Distinctions within a substance are mental or rational rather than real (though this is a rather strong and probably also highly controversial claim), the substance has thus unity and inseparable components[64] and these components relate to each other in terms of form and matter or actuality and potentiality. He furthermore maintains that there is a close connection between action and being, and he never abandons the idea that substantial individuals are characterized first and foremost by their activity.[65] Even

[61] Maria Rosa Antognazza, "Metaphysical Evil Revisited," in *New Essays on Leibniz's Theodicy*, ed. Larry M. Jorgensen and Samuel Newlands (Oxford: Oxford University Press, 2014), 127-28.
[62] 'Disputatio' §10, G IV 20.
[63] See, e.g., G II 97/LA 121.
[64] The notion of 'component' comes dangerously close to suggesting a kind of formal, if not even real, distinction. But, as will become hopefully clear in the following, one of these two 'components', the passive or material aspect, neither allows for a positive definition nor is it an *ens* at all.
[65] See e.g. 'De primae philosophiae Emendatione, et de Notione Substantiae' (1694): G IV 469/L 433; 'Système nouveau de la nature et de la communication des substances' (1695): G IV 478/AG

during the late 1660s and the early 1670s, i.e. what one might consider to have been the mechanistic phase Leibniz claims of having gone through according to his letter to Rémond, he emphasizes the role of motion (and later: of force) for matter and the impossibility of matter being capable of producing motion by itself. Already at this point one of matter's crucial properties, motion, is dependent on some mind, though not yet always only on individual substantial forms, but in the case of inanimate objects it is dependent on God.[66]

It is difficult to evaluate the importance of the *Disputatio* for Leibniz's subsequent development. While the structure and the content, namely the authors and views covered in it, suggest to some interpreters that it is no more than "a scholastic exercise"[67], others are inclined to take it as the starting point for a developmental story of Leibniz's philosophy[68]. We have seen that the letter to Rémond seems to suggest a radical change in his thinking,[69] but also that this description is difficult to interpret – at least without some explanatory underpinning. Since Leibniz does ascribe to himself a conversion (though not a permanent one) to mechanical philosophy, having happened possibly before the time he finished university, this letter might suggest that he indeed wrote the *Disputatio* purely as a scholastic exercise without any commitment to the theses presented in it. But this is by no means what the letter explicitly states, and it is rather open what exactly it was that he abandoned. Christia Mercer stresses, in my opinion quite rightly, that his statements do not indicate "a conversion from Aristotelianism to modernism. Although he rejected scholastic physics, he did not reject Aristotelianism"[70], but he rather "opt[ed] for the better of two explanatory models in natural philosophy"[71]. Limiting this claim down to a particular field of

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139. There are countless examples for this as well as for the view that 'actiones sunt suppositorum' and that there is a connection between activity and essential unity (not only in Leibniz and the preceding Scholastic tradition, but in some sense also in the early modern mechanist philosophy.)

[66] For example the letter to Thomasius, April 20/30 1669 (G I 15-27/L 93-104) or 'The Confession of Nature against Atheists' (1669; G IV 105-110/L 109-113.)

[67] Garber, *Leibniz. Body, Substance, Monad*, 55; for a discussion of the 'Disputatio', see ibid. 55-58.

[68] See, for example, Cover and O'Leary-Hawthorne, *Substance and Individuation*, 10-50. Also Benson Mates claims that "the rather unusual and implausible doctrine that things are individuated by their 'whole being'" survives from the 1663 to the end of Leibniz's life. (Benson Mates, *The Philosophy of Leibniz* (Cambridge: Cambridge University Press, 1986), 7.)

[69] To Rémond, 10 Jan. 1714,G III 606/L 654-5.

[70] Mercer, *Leibniz's Metaphysics: Its Origins and Development*, 45.

[71] ibid., 47.

interest such that it not have a major impact on the overall view on Leibniz's philosophy allows one to uphold the idea that there is an overarching metaphysical framework within which his philosophy gradually develops from the early years into his late, full-blown mondadological metaphysics, while at the same time reminding us that there are significant changes happening to objects which are considered within this framework. While his commitment in his younger years (but also, to a certain extent, in his later monadological years) to mechanical principles is undeniable[72], it does not necessarily contradict certain Thomistic-Aristotelian assumptions in metaphysics. It should not surprise us that Leibniz already at a very young age might have felt free to combine different positions such as various Scholastic assumptions with modern mechanical approaches, given the influence of his teacher Jakob Thomasius[73]:

> ... J. Thomasius who, although he did not accept my doubts and was very little disposed to let me do such a reform of the substantial, incorporeal forms of bodies, engaged me very strongly to read Aristotle ... Aristotle seemed to me to admit, more or less like Democritus or, in my time, like Descartes and Gassendi, that there is no body which can be moved by itself.[74]

Thomasius himself was an 'eclectic' and his conciliatory attitude towards philosophers and their theories was clearly shared – if not even surpassed – by Leibniz.[75] In the last quoted passage and even more so in his 1669 letter to Thomasius, Leibniz, in accordance with this attitude, seems to attempt to reconcile the notions that form the core of Aristotelian philosophy with the notions that

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[72] See Leibniz's letter to Thomasius of 1669, G I 15-27/L 93-104 and *Hypothesis physica nova* (1670/71?), A VI ii 219-257.

[73] The influence of Thomasius's thought on Leibniz in his younger years is generally acknowledged, but one of the few more extensive treatments of his philosophy is found in Mercer, *Leibniz's Metaphysics: Its Origins and Development*, esp. 32-36. For a short, but classical account of Thomasius, see Max Wundt, *Die Deutsche Schulmetaphysik des 17. Jahrhunderts* (Tübingen: J. C. B. Mohr, 1939), 142-143.

[74] Foucher de Careil, *Mémoire sur la philosophie de Leibniz,* quoted in Mercer, *Leibniz's Metaphysics: Its Origins and Development*, 43. According to Foucher de Careil, this passage has been written during the 1660s.

[75] See, e.g., his 1669 letter to Thomasius, where Leibniz states that "I maintain the rule which is common to all these renovators [restauratores] of philosophy, [namely that] *nothing ought to be explained in bodies except* through magnitude, figure, and motion" (G I 16/L94), but later we can read in the same letter that "I do not hesitate to say that I approve of more things in Aristotle's books on physics than in the meditations of Descartes" (G I 16/L 94). Or, late in his life, Leibniz writes to Rémond in 1714 that "I have found that most sects are correct in the better part of what they put forward, though not so much in what they deny…" (G III 607/L 655)

have taken their place in the explanatory model of mechanical physics of the 17th century. He even concludes in this letter that the subject of Aristotle's physics is "figure, magnitude, motion, place, and time"[76]. But again he is talking about physics only, not about all of Aristotelian philosophy. Some commentators even deny that this letter should be taken as a serious exposition of his philosophical view.[77] This suggested compatibility seems to be a rather odd claim and mechanical philosophers at the beginning of the 17th century might have begged to differ concerning the proposed view that mechanical philosophy does not stand in a complete opposition to Scholastic or Aristotelian philosophy. But it is indeed the case that this opposition seems to hold only if mechanical philosophy claims that the *only* interpretation concerning all fields of science, thus including metaphysical and ontological issues, permissible is quantitative, i.e. in terms of size, shape, and motion.[78] Leibniz sees clearly that it is possible to be a mechanical philosopher concerning physical phenomena (thus abandoning Scholastic accidental forms as explanatory principles of the individual behaviour of physical bodies), while being an Aristotelian concerning substantial forms or the constitution of substance.[79] But he furthermore claims (and this seems to be another constant throughout the years) that one must assume substantial forms in order to ground the phenomena in the natural world. While Leibniz accepts Descartes' and others' rejection of substantial forms in the explanation of concrete physical phenomena (a position he thought, at least in his younger years, could also be ascribed to Aristotle himself), he also assumed there must be something other than body that is the cause of motion,

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[76] G I 21/L 98.

[77] Ursula Goldenbaum, "Transubstantiation, Physics and Philosophy at the Time of the *Catholic Demonstrations,*" in *The Young Leibniz and His Philosophy (1646-76)*, ed. Stuart Brown (Dordrecht: Springer, 1999), 94.

[78] See Beeley, *Kontinuität und Mechanismus*, 3. Most early modern philosophers did not attempt a reduction of everything there is to mechanical qualities, at least not explicitly – Hobbes might be one of the few exceptions to this rule. This is not further surprising, since it seems *prima facie* incredibly difficult to bring such an explanatory model in accordance with an immaterial and possibly also free soul.

[79] Though his idea of physical explanation dramatically shifts over the years, especially due to the introduction of the notion of force into his metaphysics and the corresponding reasoning that physics is essentially dynamics, Leibniz from a very early age on holds that physical phenomena are explainable in quantitative terms. Even if one takes his self-depiction to Rémond at face value, it does not follow that Leibniz ever completely abandoned Aristotelian philosophy. There is good evidence that substantial forms (even though they appear under different names) form a constant feature of his metaphysics and play an essential role in the foundation of physics through to the end of his life. In this light, his depiction of his own development is rather emphasizing different ideas attached greater importance to at various points in his life than a story of shifting philosophies.

something that is distinct from body as such, and that this something falls into the realm of metaphysical rather than physical explanation.

In these considerations we see a continuation of the general thought already present in the *Disputatio*, that substances do require a principle of activity, but this idea will in the years immediately following be accompanied by further thoughts connected with the idea of substance that will finally lead to and culminate in the introduction of 'simplicity' as a core feature. Leibniz's consideration concerning the essence of substantiality in the following years is strongly influenced by his growing interest in physics, especially in the problem of the coherence of bodies and of the continuum, i.e. the possibility of corporeal substances or bodies having unity. While we still seem to see Leibniz trying to deliver an account of how bodies *might* be substances, his considerations will slowly but steadily draw him towards a more sceptical view, the investigation of which Leibniz will dedicate a significant amount time to in the years immediately following his university studies, and which we will take a look at after having covered some first thoughts on the notions of part and whole.

Only a year after the *Disputatio*, Leibniz writes the 'Specimen quaestionum philosophicarum ex jure collectarum'[80], a piece that is first and foremost concerned with legal issues and their connection to philosophy. But it proves to be interesting for the purpose at hand for two reasons: In the context of legal accountability, Leibniz emphasizes the importance of the question what it is that accounts for sameness over time.[81] And here he "indicate[s] substantial form as the key for transtemporal sameness"[82]. This implies that he has not adopted a purely mechanical philosophy, but also that he is still moving within a framework strongly influenced by Scholastic concepts. More importantly at this point, however, is the introduction of different ideas of 'whole'. Following François Hotman, a French legal philosopher, Leibniz introduces three kinds of wholes: A continuum is what is naturally one, such as a human or a tree; the contiguous, which is something whose parts are connected but not forming a natural unity; and the discrete, whose parts

[80] 'Specimen quaestionum philosophicarum ex jure collectarum' (1664), A VI i 69-95.
[81] ibid. 90-91.
[82] Di Bella, *The Science of the Individual*, 119.

are distant. While all of them are types of composition and are referred to as 'wholes', only items in the first category, i.e. only continuous things, form true unities, since they have a spirit (*spiritus*).[83] We find in this very early text two things of importance for the following, on the one hand a very broad notion of what a whole is, a notion that does not require unity in a strict sense, and on the other hand the idea that a natural unity, as it is possessed by animate things such as humans and trees, is to be established by an immaterial principle.

This interest in parts and wholes continues when Leibniz outlines in 1666 for the first time his plan for a combinatorial science[84] at the heart of which several explicit metaphysical assumptions lie. Here he continues the theme of unity, but in addition defines metaphysics as the doctrine of the whole and the parts ("doctrina de Toto et partibus"[85]), i.e. as mereology, and identifies "being and the affections of being"[86] as its subject. Since this combinatorics is supposed to be universally applicable, it seems necessary for Leibniz to argue that the fundamental combinatory relation of part and whole is mirrored in the things themselves.[87] While substance is defined in accordance with his earlier and later writings as "whatever moves or is moved", i.e. as something active and passive, the term 'whole' is applied in a wider sense than might be desirable for metaphysics, but in accordance with the earlier judicial writing. For the purpose of his art of combination, Leibniz allows that any number of things may be treated as a whole. The only requirement for several things to be considered as being parts of one and the same whole is that these things have something in common. There is no further specification as to what this 'something in common' has to be, it is only required that it is of such a kind that it supplies a ground for our reason to apply one name to all these otherwise possibly widely different things. This whole is thus grounded in taking things simultaneously as one, while this 'one' is what is thought of in one intellectual act.[88] Even though the term 'whole' as such might suggest some kind of

[83] 'Specimen quaestionum philosophicarum ex jure collectarum' (1664), A VI i 92-93.
[84] 'Dissertatio de arte combinatoria' (1666), G IV 27-104.
[85] ibid. G IV 36.
[86] "Metaphysica […] agit tum de Ente, tum de Entis affectionibus" (ibid. G IV 35).
[87] Cf. Beeley, *Kontinuität und Mechanismus*, 6
[88] 'De arte combinatoria' (1666), G IV 35. This idea that there is a mental act that is fundamental for the constitution of aggregates features more prominently in Leibniz's later thought. For a

underlying unifying principle that, so to speak, glues the parts together into or provides the basis for summarizing them under 'one thing', we see here that this is not the case in Leibniz's mereology. The parts of the whole can themselves be smaller wholes (as is required for his *ars combinatoria*) or a multitude of different individual objects, and Leibniz seems to be willing to reserve the term 'whole' and hence also that of 'part' for such liberal use. It looks, *prima facie*, as if this broad use of the term 'whole' allows for it to be applied to substances, but equally to collections of substances, and that there is, therefore, a fundamental difference between being a whole and being a unity – where the notion of 'unity' turns out to be prior to and more fundamental than that of 'whole': "The concept of *unity* is abstracted from the concept of one being, and the whole itself, abstracted from unities, or the totality, is called *number*. *Quantity* is therefore the number of parts. Hence quantity and number obviously coincide in the thing itself [*res ipsa*]…"[89] There are two questions to be raised concerning substances or individual things: Is every whole a substance? The answer to this is clearly 'no' – there is hardly any limitation on what a whole can be. And while unity is essential to substance, it does not seem to be essential to a whole. The second question is: Is every individual substance a whole? It seems possible that Leibniz has here in mind that the 'thing itself', the substance, is quantitatively and numerically one, i.e. has one part and is one thing. This might seem to be the preferable way to go for anybody who wants to see the beginnings of a monadological metaphysics very early in Leibniz. But one should keep in mind that a definition which identifies the overall 'number of parts' as one, i.e. the same number as that of the whole, threatens to violate the principle that the whole is greater than its part. While this is itself not problematic (one might for some reason want to allow parts that are not proper parts), it becomes problematic when one recalls that Leibniz seems to hold on to this

discussion, see Paul Lodge, "Leibniz's Notion of an Aggregate," *British Journal for the History of Philosophy* 9.3 (2001).

[89] "Abstractum autem ab uno est *Unitas*, ipsumque totum abstractum ex unitatibus seu totalitas dicitur *Numerus*. *Quantitas* igitur est Numerus partium. Hinc manifestum, in re ipsa Quantitatem et Numerum coincidere…" (G IV 35/L 76)

principle consistently throughout his life and that it carries quite a lot of explanatory responsibility.[90]

As this passage by itself leaves us rather puzzled, one might need to take a further step, even though it is not explicitly entailed in Leibniz (though very likely in his spirit): If one regards it a necessity that every part of a whole is a proper part, one might think that in order to form a whole, there must at least be one other proper part, together with which the first part forms a whole. If this is allowed as a plausible thought, then it becomes impossible that something has only one proper part and thus, when there is only one part in a thing, then we cannot call this a 'part proper', but it is rather a part that collapses into or is identical with the whole, such that we would say no more than 'the whole is the whole'.

But it is also possible, because Leibniz does not clearly distinguish between metaphysical, physical and logical implications of the various definitions in this writing, that there are some significant differences between the whole of the logical calculus, the metaphysical whole and physical whole. The whole of the logical calculus can be broken up into parts which are smaller wholes and form the basis of complexions and which are ultimately analysable into smallest parts or unities, the *situs*.[91] These parts are in their existence not dependent on the existence of the whole, but it is a rather contingent fact that some of them are thought of as belonging to one overarching whole or are thought of in one act, while others are not. A body, on the other hand, could be said to have an infinite number of parts, or in other words, the continuum is infinitely divisible.[92] Bodies as such, it seems, do not seem to have any smallest parts or unities. A further difference might be that those wholes which are composed of an infinite number of parts – if they should exist at all – might have a different principle that underlies their 'wholeness' than just being thought of or abstracted by a mind in a certain way rather than another. Since matter by itself, for Leibniz, is uniform (in all of the different ways it seems to be entertained by Leibniz in his younger years, i.e. in a way resembling

[90] Furthermore, this principle is also relevant for the basics of his combinatorics, since one of its fundamental operations is concerned with wholes (e.g. ABCD) and proper parts of these wholes (e.g. ABC, ABD, ACD, BCD or AB, AC, AD, BC, BD, CD). Here it is important that a thing cannot be a proper part of itself (and thus complexions of the form AAA or AA are impermissible).
[91] 'De arte combinatoria' (1666), G IV 36.
[92] ibid., G IV 32.

Cartesian *res extensa* as well as being close to Scholastic prime matter), there do not seem to be any grounds in matter in itself for regarding some bits of it as forming one body, while adjacent bits are excluded from it or maybe even forming a different body. But at the same time, it does not seem to be arbitrary that we refer to something as 'one body' and where we claim to find a boundary between one body and the next. When it comes to bodies, there seem to be two options open for Leibniz, none of which he seems to consciously entertain in this particular writing, but, as we have seen, in other writings around that time: Either bodies are unified into wholes by something else, i.e. something not constituted by matter and thus immaterial such as a substantial form, or he denies that matter in this substantial sense does enter into wholes which have parts or indeed into wholes at all. I take him to start this thought process in the 1660s with the view that the former option is accurate, because he does not yet regard the idea of matter as infinitely divisible (and later as infinitely divided) as highly problematic. Once he has occupied himself with the problem of the continuum and reminded himself of the whole-part-axiom, there seems to be a gradual change towards the latter option. But even if this is the case, it does not touch upon the overall functionalist distinction into form and matter, since these explanatory principles allow Leibniz to entertain a variety of different positions concerning the ontology of form and matter – a liberty Leibniz makes generous use of. And with this development we see a clear difference between the wholes of the logical calculus and of physical wholes emerge, both in composition and analysis: In the case of bodies, in accordance with our experience, the application of the term 'whole' is regarded to be less arbitrary and better grounded than in the case of logical wholes, i.e. there seems to be more unity in a whole that is a body than in a whole that is merely a summarizing term. But also the analysis of these wholes seems to deliver different results: While there is an assumed bottom level in the decomposition of complex into simpler terms, this does not seem to be true about the decomposition of bodies into smaller bodies. We will encounter this opposition again when taking a closer look at corporeal substances, their aggregation and unity, which will be part of the reasoning that lead Leibniz to assume simple substances (similar to the simple parts of his combinatorics). In these years, Leibniz seemingly develops a

view on natural philosophy that regards physics as the meeting point between reason and experience, or between mathematics and nature. It is a view that tries to account for the fact that the hypotheses of reason and mathematical calculations do not absolutely match the phenomena, but that they are close enough such that the marginal error can be disregarded.[93]

But what we have not accounted for yet is the phenomenon of what seems to be a stronger unity in bodies – a problem that occupied Leibniz especially during his time in Paris: What it is that makes a body's parts cohere such that they form a body at all and how this body could be constituted.

1.2.2. Continuum and Cohesion

The question whether there is a bottom level in nature has been entertained by Leibniz from his early years on and he gives an almost excessive amount of different accounts of the possible constitutions of material things in the 1670s and 1680s. A first Gassendian attempt hopes to solve the problem of the continuum by composing it of points separated by unassignable gaps, but this account is quickly substituted by the idea of a composition out of an infinity of parts that are smaller than any assignable part, and several other twists follow within a few years.[94] During those years, Leibniz also develops his infinitesimal calculus, and arrives in 1676 at the conclusion that infinitesimals are 'fictitious entities'[95], i.e. not to be found in nature. Though Leibniz seems to have experimented with a wide variety of different positions, the sincerity of his commitment to any them and the various problems of the solutions are of less interest here. But there are several remarkable features to these manifold solutions. Firstly, Leibniz treats the problem of the continuum as a fundamental problem not only for mathematics and physics, but also for metaphysics: "Only Geometry can provide a thread for the Labyrinth of

[93] Cf. Philip Beeley, "Mathematics and Nature in Leibniz's Early Philosophy," in *The Young Leibniz and His Philosophy (1646-76)*, ed. Stuart Brown (Dordrecht: Springer, 1999), 123-145.
[94] For a detailed exposition of this development, see Arthur, "Actual Infinitesimals in Leibniz's Early Thought" and his introduction to *The Labyrinth of the Continuum*, RA xxiii-lxxxviii.
[95] 'Numeri infiniti' (1676), AVI iii 499, quoted in RA xxiii.

the Composition of the Continuum, of maximum and minimum, and the unassignable and the infinite, and no one will arrive at a truly solid metaphysics who has not passed through that labyrinth."[96] While geometry and the infinitesimal calculus are providing a solution for the geometrical continuum, it is metaphysics that tells us that such infinitesimals cannot be found in nature, such that there is "no portion of matter that is not actually divided into further parts, so that there is no body so small that there is not a world of infinitary creatures in it."[97] This rejection of infinitesimals as fictions might come as a bit of a surprise, since Leibniz seems to have more or less consistently held the view that matter was actually infinitely divided. We have already seen that Leibniz incorporates the view of a discrepancy between mathematics or reason and the phenomena, but is nonetheless reluctant to abandon phenomena. Despite trying to accommodate the corporeal objects of our daily encounters with the world, at some point almost Berkeleyan sounding views are tentatively proposed by Leibniz, which can be explained by his struggle with the nature of corporeal things and which suggest that the view that "[a]ccording to certain ways of reasoning, it follows that to be is nothing other than to be capable of being perceived"[98] might be a viable option.

A further reason for Leibniz's consideration that what appears to us as extended is in fact not entirely what it seems and to an extent a phenomenon partially dependent on the perceiver might already lie in his definition of matter and body present in the 1660s, as a letter to his teacher Jakob Thomasius indicates:

> Primary matter is mass itself, in which there is nothing but extension and antitypy or impenetrability. It has extension from the space which it fills. The very nature of matter consists in its being something solid and impenetrable and therefore mobile when something else strikes it, and it must give way to the other.[99]

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[96] ibid.
[97] 'Pacidius Philalethi' (1676), A VI iii 566/RA 209.
[98] 'De materia, de motu, de minimis, de continuo' (1675), A VI iii 466/RA 31; see also 'Corpus non est Substantia sed modus tantum Entis sive apparentia cohaerens' (1689-1690 (?)) A VI iv 1637/RA 259-260, where Leibniz concludes that bodies (in the sense of bulk) are therefore nothing but coherent appearances.
[99] Letter to Thomasius (1669), G I 17/L 95.

As the term 'extension' is by Leibniz equated with "mathematical body"[100], we might consider this primary matter to be the infinitely divisible body of *De arte combinatoria*. (In difference to later writings, bodies here are infinitely divisible, not infinitely divided yet.) But this is not to say that Leibniz had anything like a Cartesian extended substance in mind – and we are indeed warned by Leibniz himself in the opening of the letter to his teacher that he is "anything but a Cartesian"[101]. This leads us to the second feature present in his writings on the continuum, which seem to be already found in his earlier writings, even though not thoroughly exploited, namely that matter on its own is insufficient for explaining the phenomena of the physical world and for being considered to be substance by itself, because it lacks a principle of activity or motion. In an unanswered letter to Thomas Hobbes, written in 1670, Leibniz declares his sympathy with the Englishman's definition of sensation as permanent reaction, but at the same time he points out that there is no truly permanent reaction in the nature of merely corporeal things. Even though, Leibniz claims, it may appear to our senses as if there was such a permanent sensual response, it is in fact only a discontinuous reaction which constantly needs to be simulated by a new external cause. Thus, Leibniz concludes, true sensation cannot be explained by motion of bodies alone.[102] But Leibniz is, on the other hand, very sympathetic towards Hobbes's account of conatus and aims to broaden it in such a way that it can include minds in an essential function as well. Minds, during the early 1670s, are thought of by him as conatus as well, a view with which Leibniz hoped to solve the problem of the interaction between mind and body as well as a reconciliation of Christian doctrines, mechanism and the philosophical tradition.[103]

While this criticism as presented to Hobbes might be read as being limited to sensations, we do find a similar but more general argument in the *Confession of Nature against Atheists* (1669). As the title already suggests, this piece of work is aimed at providing a proof for the existence of God by showing that corporeal

[100] ibid. G I 24/L 100.
[101] ibid. G I 16/L 94.
[102] Letter to Thomas Hobbes (1670), G VII 574/L 107.
[103] See Goldenbaum, "Transubstantiation, Physics and Philosophy," 93.

phenomena cannot be explained without some incorporeal principle. Even here Leibniz is rather sympathetic towards the new mechanical philosophy and its principles, as "in explaining corporeal phenomena, we must not unnecessarily resort to God or to any other incorporeal thing, form, or quality […], but that so far as can be done, everything should be derived from the nature of body and its primary qualities – magnitude, figure, and motion".[104] Leibniz holds that in the realm of physics, that is, for the explanation of 'corporeal phenomena' and the behaviour of bodies, only a few properties are required. But he also holds explicitly only that motion cannot be the essence of extended things or an essential attribute thereof.[105] A few years later, we will find the additional criticism that extension itself is not a primitive quality, but one that arises from the diffusion or repetition of impenetrability. Though Leibniz seems to vacillate between the idea of matter as pure potentiality and matter as extended, impenetrable stuff, the idea that an essential principle, which is necessarily required not only for grounding the explanation of physical phenomena but also for substantiality in general, is missing in matter taken by itself: activity, which, in the case of bodies, is motion (and which is later going to be substituted by force as the most fundamental principle). Thus bodies are not self-sufficient and cannot subsist without an incorporeal principle. (Here he seems to be going the first way mentioned above, entertaining the idea that bodies require some kind of incorporeal principle in order to exist.) We find something similar indicated in the letter to Thomasius: There is nothing in bodies which does not follow from the definition of extension and antitypy.[106] But motion cannot be derived from either of the two. Therefore, there is no motion as a real

[104] 'Confessio Naturae contra Atheistas' (1668), A VI i 489-90/L 110.

[105] Christia Mercer traces this back to the inability to deduce motion from extension and impenetrability. See her *Leibniz's Metaphysics: Its Origins and Development*, 123-24. But one might regard it as a more general criticism: Nothing purely passive, such as a merely extended, impenetrable being can, in principle, be the origin or even genuine bearer of any active properties such as motion.

[106] It is remarkable that already the very young Leibniz seems to hold that the Cartesian definition of one type of substance as having extension as its only principal attribute is insufficient, such that he feels the need to complement it with 'antitypy' (or 'impenetrability'). This insufficiency will be, later on, one of the explicit and driving forces in his pronounced criticisms of Descartes' conception of extended substance.

entity in bodies.[107] This argument is even more clearly developed in a text on transubstantiation, probably written in around 1668:[108]

(1) Whatever is a substance has a principle of action within itself.
(2) Every action of a body is motion.
(3) No body has a principle of motion within itself apart from a concurrent mind. (No reason for motion can be found in bodies left to themselves.[109])

Therefore: Body apart from a concurrent mind is not a substance.

(4) What is not a substance is an accident or an appearance.

Therefore: Body apart from a concurrent mind is an accident or appearance.

The assumption underlying (3) is the fact that extension and its modes cannot account for motion by themselves, an assumption that is not original to Leibniz, but also shared by others such as Descartes or Gassendi, who introduce God as the maintainer of motion in the world or God as the creator of atoms endowed with motion, respectively. For both, therefore, motion is not intrinsic to or generated by extended bodies by themselves.

The conclusions from this argument are interesting in several ways. On the one hand, body as an accident or an appearance is an unorthodox view to arrive at and seems to suggest that body is some kind of property of a substance, either just as inhering in a substance (as an accident), a kind of secondary quality, that merely appears to be in a certain way, or even merely a perception or appearance. In either case, it seems that the substantial thing is the concurrent mind rather than the body – independent of the body being regarded as related to the concurrent mind as an accident or an appearance. On the other hand, that the origin of motion cannot be found in bodies themselves is supported by a further argument in the *Confessions of Nature against Atheists*, where Leibniz aims to show that the contrary assumption leads to a dilemma. It would require that either motion has been in a body from all

[107] Letter to Thomasius (1669), G I 26/L 102.
[108] 'De transubstantiatione' (1668?), A VI I 508-09/L 115-116.
[109] 'Confessio Naturae' (1668), A VI i 419/L 111.

eternity – but eternity does not give a sufficient reason for why something is nor can it be considered to be the cause of anything –, or motion has been transferred to one body by another body, but this other body must itself have gained its motion previously from a third body, and so on, such that this explanation gets caught in an infinite regress of reasons. In either case, Leibniz claims, no full explanation or sufficient reason can be given for the motion of body considered in itself and indeed cannot be given until one takes the existence of incorporeal principles into account.

But even though we cannot ascribe existence or subsistence to matter by itself, Leibniz indicates that we can nonetheless think of it without taking its substantial form into account at the same time: "I call appearance whatever can be thought of in a real body deprived of substantial form, that is, matter taken with its accidents."[110] A few years later, in 1671, Leibniz thinks again about the possible phenomenal character of bodies and its relation to the essence of a thing:

> By the word *thing* we mean that which appears, hence that which can be understood; because when we are deceived and recognize our error, we may still rightly say that something has appeared to us not that it has existed.
> The *nature* of a thing is the cause, in the thing itself, of its appearances. Hence the nature of a thing differs from its phenomena as a distinct appearance differs from a confused one… [W]e think of a body whenever we think of extension being somewhere but at the same time think of a phenomenon.[111]

It is hard to see in this short passage what Leibniz is exactly aiming at, but he seems to suggest that there is a tension or difference between the essence or nature of a thing and its body. One reason for introducing the idea that bodies are to some extent phenomena, i.e. something analogous to confused appearances, might be grounded on the fact that his idea of the nature of matter seems to have changed. In his *Theoria motus abstracti* (1671), Leibniz explicitly formulates a change in his

[110] 'De transubstantatione' (1668), A VI i 511/L 117.
[111] 'An Example of Demonstrations about the Nature of Corporeal Things, Drawn from Phenomena' (1671), L 142-3.

views on the continuum and thus on bodily (spatially extended) substances: "(1) There are actually parts in the continuum […] and (2) these are actually infinite, for Descartes's 'indefinite' is not in the thing, but the thinker."[112]

It becomes clear that from the *Disputatio* on, Leibniz's thought in various areas is occupied with answering the question how not only to think of an infinitely divided thing, but also how the apparent coherence as one individual thing can come about at all. And while there are drastic changes in the underlying physical theories, there seems to be an overarching theme: Leibniz's train of thought starts from the scholastic idea that substances are necessarily active and obtain their activity from some substantial form (be it a soul, God, or some other active principle). "His thought seems to have progressed from bodies held together by endeavours, to atoms held together by minds, to divisible bodies held together by harmony of motion, but whose unity comes from a principle analogous to a mind."[113] In the end, mind-like substances are the *conditio sine qua non* for substantiality and unity.

Before moving on to more thoroughly developed metaphysical writings by Leibniz, it might be wise to take stock: The picture drawn from a plethora of different writings by Leibniz, before he presents a rather systematic account of his picture of substance and creation to Arnauld, suggests a severe uncertainty concerning the status of extended things. He tries to come to grips with the tension of his rational metaphysics and mathematics with the phenomena we encounter and the extended things that form the basis of our physical systems. The thread we see running through all of these considerations is a strong hold onto substantial forms as the driving principle that accounts in some ways for the possible unity of bodies and their seeming activity. While Leibniz does not seem certain yet about the ontological status of bodies, and partly does not seem ready to abandon them at this point, a significant amount of the explanatory weight is by the end of the 1670s already deferred to the substantial forms. By the time he presents his views

[112] *Theoria motus abstracti* (1670/71 (?)), A VI ii 264/RA 339.
[113] RA xliii.

to Arnauld, substantial forms will be the driving and fundamental metaphysical principle.

But what has to be kept in mind is that Leibniz is adamant in distinguishing sense experience that provides us with acquaintance of phenomena and forms the basis for physics from rational and mathematical principles reason provides us with. While he does not think that senses deceive us (even though they might suggest misleading information, which we have to analyse correctly and should not be overly hasty to accept as an accurate picture of the world), he thinks that reason gives the fundamental principles, which tell us what the objects of our perceptions can and cannot be. This view also means that the talk of extended things, such as those we perceive, does not necessarily entail that these can enter the realm of substances in the strict sense.

2. To Arnauld: Complete Concepts and the Unity of Substance

Leibniz's correspondence with Arnauld (1686-90), facilitated by the transmission of a cursory summary of the *Discourse on Metaphysics* via an intermediary[114], is a valuable source for several reasons. It seems to be the first extensive work by Leibniz that contains a more or less fully developed metaphysical view, which might be seen as a step away from the younger years of search and wonder or as a first decisive move towards the later monadological writings. But, most importantly, in contrast with the *Discourse* itself, Leibniz continued to edit the manuscripts of his correspondence with Arnauld with the aim of its publication in the long run. Even by the time he had introduced explicitly simple substances in the mid-1690s and even far later and deep in the monadological period, Leibniz still showed interest in these texts – presumably because they had interesting insights to contribute to his philosophical views.[115]

The beginning of the exchange of letters is dictated by Arnauld's worries concerning one of the most fundamental assumptions concerning substances that Leibniz presents, namely the idea that what characterizes any individual created substance is the possession of a complete concept. This is not, as far as Leibniz is concerned, a radical claim but rather a consequence of his – and, so he assumes, also for others plausible – view on truth and true predication. But once Leibniz removed, at least in Arnauld's opinion, the looming threat of fatalistic necessitarianism from the correspondence (or, alternatively, when Arnauld let the subject go in order to proceed in the discussion), the question of the unity and nature of substance in general and bodily substance in particular becomes prominent. Even though the correspondence ends rather abruptly due to an

[114] This intermediary was Landgrave Ernst von Hessen-Rheinfels. For information on him and his relation to Leibniz, see Sleigh, *Leibniz and Arnauld*, 15-25.

[115] See LA xiii-xiv and A II ii XXIX-XXX. As Woolhouse and Francks (WF 116, fn. 94) point out, there is also an announcement of the upcoming publication of the correspondence to be found in the *Mémoires de Trévoux* from July 1708. But this aim of publication also brings with it a further complication, namely that of textual evaluation: Leibniz continued to draft and re-draft the correspondence and added remarks later. See Anne Becco, "Aux sources de la monade: Paléographie et lexicographie leibniziennes," *Les Études philosophiques* 3 (1975).

absence of incoming replies and objections by Arnauld, it provides an interesting insight into Leibniz's views on the problem of substantial unity on a logical as well as physical-metaphysical level. We will look at both in turn now.

2.1. The Logical Strand: Complete Concepts and Individual Substances

The beginning of the correspondence is set off by a rather brief outline of the individual paragraphs of the *Discourse*, beginning with a clarification of divine perfection and the nature of miracles, followed by an explanation of the concept of an individual substance: "[E]ach individual substance is an expression of the entire universe after its own manner, and [...] in its concepts all events that occur in it are included with all their circumstances and the whole succession of external things."[116] This completeness of substance entails, among other things, that substances are self-sufficient and sheltered from any kind of direct causal influence from other created substances. Hence the notions of 'action' and 'passion' require a reformulation in accordance with this independence claim, at least if one wants to speak metaphysically strictly and accurately. This reformulation is provided by Leibniz in terms of an increase and decrease, respectively, of expression within the individual complete substance itself.

Arnauld is, in his initial reaction to this very short summary of the contents of the *Discourse*, first and foremost concerned about the fact that the completeness-of-concept claim seems to entail that once Adam, the first man, is created, everything that happens afterwards happens by necessity (since it is already included in Adam's complete concept). But these worries are of less interest here.[117] In answering to these worries, Leibniz is also forced to spell out in greater detail what the notion of a complete concept amounts to and why he introduces it as a criterion of substantiality. He claims that God chooses "a particular Adam of whom a perfect representation exists among the possible beings in God's ideas, accompanied by particular individual circumstances and possessing among other

[116] G II 12/LA 5.

[117] For a thorough discussion of this topic and worries about the threat of necessitarianism in Leibniz in general, see Adams, *Leibniz. Determinist, Theist, Idealist*, 9-52, and Sleigh, *Leibniz and Arnauld*, 48-94.

predicates also that of having in the course of time a particular posterity."[118] It is this complete concept that also serves as the means to distinguish the actual Adam, who in some way includes the course of the actual world in his complete concept, from an infinite number of other very similar persons (or Adam-counterparts, if you wish). It thus serves as a principle of individuation that allows for picking out and distinguishing its bearer from all other created, as well as possible, substances. In order to fulfil this function, the concept must be complete since "the nature of an individual must be complete and determinate. I am even very much persuaded of what St. Thomas had already taught regarding intelligences, and which I consider to be generally true, namely that it is not possible for there to be two individuals entirely alike, or differing in number only."[119] While Leibniz presents his motivation for complete concepts to Arnauld primarily in terms of God's decision to create this particular possible world with this particular Adam and all of his posterity, when pressed by Arnauld's concerns about the consequences, he supplies a further argument for the requirement of complete concepts, namely his idea of truth: "[A]lways, in every true affirmative proposition, necessary or contingent, universal or particular, the concept of the predicate is in a sense included in that of the subject; the predicate is present in the subject [praedicatum inest subjecto]; or else I do not know what truth is."[120] There are two major questions here. On the one hand, there is a question about the connection between the logical notion of a complete concept and the metaphysical notion of substance as the thing which has a complete concept. Leibniz himself does not further elaborate on the relation between these two notions, if they are indeed two notions at all. This question is complicated by Leibniz's lack of further clarification and also of clarity in general on this point.[121] But this is not the place for a discussion of this topic and it might suffice to say that, for Leibniz, there must exist some connection between the

[118] G II 19/LA 14.
[119] 'Remark on Arnauld's letter concerning complete individual concepts', G II 42/LA 45.
[120] G II 56/LA 63.
[121] Benson Mates, quite justly, complains that Leibniz "often confuses propositions with sentences, ascribing to the former various features that properly belong to the latter. More generally, he amalgamates concepts of all kinds with the linguistic expressions that are supposed to represent them. […] He also does not always attend properly to the distinction between concepts and the individuals falling under them. Thus, for example, when he speaks of the "subject" of a proposition, he may be referring to a word or to the subject concept of the proposition or to the individual or individuals that fall under that concept." (Mates, *The Philosophy of Leibniz*, 50).

terms of a true proposition, such that all particular 'events' and 'denominations' that can truly be predicated of a substance as the subject of a proposition must be contained in the concept of this substance and that, therefore, its concept must be complete. But the foundation of what truth is for Leibniz cannot be based solely on the relation between concepts and there must be, in addition, a "real connection between the predicate and the subject"[122]. This idea is also echoed in the *Discourse*:

> Now it is evident that all true predication has some basis in the nature of things and that, when a proposition is not an identity, that is, when the predicate is not explicitly contained in the subject, it must be contained in it virtually. ... Thus the subject term must always contain the predicate term, so that one who understands perfectly the notion of the subject would also know that the predicate belongs to it.[123]

But, on the other hand, there is the question of the nature of complete concepts themselves. There has been a significant amount of discussion concerning this issue, especially concerning the question if superessentalism (i.e. each individual substance has all of its properties necessarily) or superintrinsicalness (i.e. if a substance would not have any of its properties, it would not be that substance) is the position which should be ascribed to Leibniz.[124] Be that as it may, it seems required by the function the complete concept has to fulfil, especially in its role to prevent transworld identity, that the complete concept is maximal in some sense: "We assume an enumeration of primitive properties, with concepts formed by selecting, for each primitive property in the enumeration, either it or its complement. Concepts so constructed, under which some individual could fall, are complete concepts."[125] The maximality of complete concepts, such that no further property can be added without provoking a contradiction, seems important in order to prevent it from being the case that a possible substance can be a member of two different possible words or that two different substances, even if they are

[122] G VII 300 [1686/87 (?)]: "connexio realis inter praedicatum et subjectum".
[123] 'Discourse on Metaphysics' (1686) §8: G IV 433/AG 41.
[124] The distinction is proposed by Sleigh, *Leibniz and Arnauld*, 67-72; a similar distinction is also proposed by Adams, *Leibniz. Determinist, Theist, Idealist*, 75-110. Cover and Hawthorne-O'Leary, *Substance and Individuation*, 87-142, and Fabrizio Mondadori, "On Some Disputed Questions in Leibniz's Metaphysics," *Studia Leibnitiana* 25.2 (1993), provide a critical discussion of this distinction.
[125] Sleigh, *Leibniz and Arnauld*, 50.

members of two different worlds, can share all their properties. This is clearly a stronger notion of completeness than Leibniz explicitly presents to Arnauld.

What follows from this completeness of the concept of substance are several crucial characteristics of substantiality, most of which encapsulate some kind of independence. Because each complete concept contains not only all the subject's intrinsic properties, but also, at least derivatively, all the substance's connections to its surroundings and in further consequence all events in its universe, it is in itself an expression of this universe in its entirety. But since each substance expresses all events of the universe it is a part of, the overall content of an expression is the same for each substance within one and the same universe. The distinguishing difference lies not so much in what is expressed, but in how it is done, i.e. in "the point of view from which it looks at the universe; and [...] its succeeding state is a sequel [...] of its preceding state, as though only God and it existed in the world: thus each individual substance or complete entity is like a world apart, independent of everything except God."[126] As expressions of the same universe, substances are designed to harmonize in their expressive content, and it is this harmony, in combination with the degrees of distinctness and confusion of expression, that incites us to ascribe interaction. This explanation, so Leibniz, applies equally to the interaction between a mind and its body:

> [W]hat happens to the soul is born to it in its own depths, without its having to adapt itself subsequently to the body, any more than the body to the soul. Each one obeying its laws, with the one acting freely and the other without choice, they agree one with another in the same phenomena. The soul, however, is nevertheless the form of its body, because it is an expression of the phenomena of all other bodies in accordance with the relationship to its own.[127]

What is already alluded to here is confirmed in the next letter to Arnauld, namely that it is the soul that is an individual substance, that is the kind of being whose concept includes everything: "Now, since the soul is an individual substance, its concept, notion, essence or nature must include everything that is to happen to

[126] G II 57/LA 64.
[127] G II 58/LA 65-66.

it"[128]. Here Leibniz clearly identifies the soul as a substance, while the status of body remains in this letter unclear, and so far we know only that its relation to a soul consists in a relation of expression. But Leibniz introduces, in addition, the further notion of 'bodily substances', to which the independence claims concerning substances should, as substances, surely equally apply. In doing so, he is aware that the claim that there is no interaction between substances in general, but especially the denial of interaction even between bodies, will be conceived of as being highly controversial. He acknowledges this immediately, but also suggests that the assumption of substantial forms is inevitable:

> One will perhaps be more surprised to find that I deny the action of one bodily substance upon the other, though this appears to be so evident. But apart from the fact that others have already done so, one must consider that it is a play of the imagination rather than a distinct idea. If the body is a substance and not a simple phenomenon like a rainbow, nor an entity united by accident or by aggregation like a heap of stones, it cannot consist of extension, and one must necessarily conceive of something there that one calls substantial form, and which corresponds in a way to the soul.[129]

While he had previously distinguished between the soul and its body, he seems to be willing to claim here that the body is a substance as well. But, at this point, this is far from clear, firstly, because it is not obvious that corporeal substance (*substance corporelle*) refers to the body of the soul that he has been previously talking about, that is, the body with which the soul stands in a harmonized relation of expression. But, secondly, while it is clear that a corporeal substance will be some kind of substance, to which, as it seems, also the characteristics of causal independence should apply, Leibniz might be seen as adding a further question: Independent of corporeal substance and souls, there is the further question whether the body (*le corps*) is a substance at all or only a mere phenomenon. And if the former is to be the case, Leibniz claims, 'it cannot consist of extension'. At this point Leibniz introduces again a dichotomy between metaphysics and physics: While the metaphysical explanation of bodies, if there are such things, requires substantial forms, particular physical phenomena themselves, the behaviour and laws of

[128] G II 68-69/LA 84.
[129] G II 58/LA 66.

extended objects, are to be explained without recourse to these forms, but merely in mechanical terms.

But the notion of complete concepts entails a further question: If it is the substantial form or soul that corresponds to it and which is the metaphysical correlate that entails the basis for all true predications, it seems to do the majority, if not all, of the explanatory work on a metaphysical level. It is the substantial form that entails the basis for the true ascription of properties and it is 'like a world apart'. But what job is there left to do for an additional 'body'? It might be suggested that "[w]hatever these unities are that make up real bodies, they do not seem to be souls simpliciter."[130] This seems a fair point, and so far we still have the unexplained notion of 'corporeal substance' up our sleeve. We will return to one aspect of this point below, when looking at the motivation from the argument of borrowed reality. But for the moment, let us look into its relation to the claim that individual substances have complete concepts.

Leibniz himself does not explicitly seem to connect the idea of complete concepts with that of bodies or corporeal substances. Apart from what seems to be an identification of souls or substantial forms with the bearers of complete concepts, he leaves it open how this would play out in the case of corporeal substances. But it does not seem clear that Leibniz is committed to corporeal substances composed of a soul as their substantial form and a body consisting of an infinite number of further substantial form-matter composites divided to infinity at all. On such an account, the soul serves as "a kind of incorporeal glue"[131], such that the composite yields a kind of unified, but (presumably) nonetheless extended kind of substance. While there are possible accounts of what this notion of 'corporeal substance' might amount to, it seems *prima facie* problematic to describe it as something quasi-Aristotelian. Neither, it seems, would the addition and existence of such a body add anything to the content of the expression of the soul that is the unifying substantial form, since everything is already contained in its complete concept, nor is it clear how such an account would relieve Leibniz's worries about the nature of extension and its incapability to constitute an individual being. But apart from the vagueness of how the details of such an account would

[130] Garber, *Leibniz. Body, Substance, Monad*, 78.
[131] ibid.

work, there is also a further worry that is brought about by the maximality of complete concepts and the thereby entailed independence of the bearers of such complete concepts: If we assume that one substantial form (a soul) unities in some way other substantial forms (those which unite the diverse parts of the soul's bodies, and which themselves are divided into further parts that are united by a substantial form, and so on to infinity), we have a situation where the soul's uniting – as it should be more than mere expression and yield a unity stronger than a merely perceptual one – needs to unite an infinite number of substantial forms with complete concepts specific to them and which are, therefore, necessarily different (even if only marginally, in at least one out of an infinite number of aspects) from the uniting soul. Each of the complete concepts that inform or unify the various parts of its body must have each at least one property whose opposite or negation is part of the complete concept of the soul. In short, if maximality is assumed, each actual (as well as possible) substantial form must have a complete concept that differs in at least one property from all other (actualized as well as possible) complete concepts. If we now look at the complete concept of the soul in its relation to the complete concept of any of the other, subordinate substantial forms it supposedly unites, then we get the following picture: There must be one property in each of these subordinate substantial forms that is not only not a constituent of the complete concept of the soul. But, due to maximality criterion, it must further be the case that the negation of this property is a constituent of the soul's complete concept, since for each property it is the case that either it or its negation is entailed in any complete concept. It seems hard to see how the soul could unite an infinite number of such substantial forms, some of whose properties stand in contradiction to its own complete concept, in a more substantial sense than by expression, i.e. it is hard to conceive of a way that the soul could be the unifying principle for a body consisting of all those individual bodily parts informed by their own substantial forms, such that one being or a substance results from it.

It seems that during the 1680s, Leibniz not only further develops the role of substantial forms in metaphysical explanations, but that he also strengthens its

independence and self-sufficiency.[132] While the correspondence with Arnauld itself does not seem to allow for a definitive ascription of a certain ontology to Leibniz, the notion of a complete concept seems to limit the possible options. But it is by no means clear that the question of ontology is one that is pressing for Leibniz at this point in time.

2.2. The Problem of Extension and the Unity of Substance in the Mid-1680s

While Arnauld seems satisfied with Leibniz's explanation of complete concepts as grounded in his notion of truth, he immediately picks up on Leibniz's suggestion that any explanation of the existence of bodies demands the introduction of substantial forms, even though he introduces a twist to Leibniz's original formulation. While Leibniz only states that 'if body is a substance'[133], Arnauld paraphrases it as 'in order for body *or matter*'[134] not to be a mere phenomenon, the introduction of substantial forms is required. It is not Leibniz himself who introduces matter into the discussion, but he also does not seem to object much to this intrusion. In his answer, Leibniz is rather tentative and seems unwilling to make an explicit commitment to the existence of bodies at all. Hence his elucidations seem to be based on the conditional that if there are bodies, then certain, metaphysically severe consequences will follow.[135] And these consequences illuminate certain passages from the summary he had originally sent to Arnauld. Having occupied himself for years with questions concerning the constitution of physical objects and the question of their unity, Leibniz seems to have, by the time of his writing to Arnauld, found decisive reasons to doubt the fundamentality of

[132] Brandon Look argues similarly: "As soon as Leibniz defines a substance as a being having a complete concept, he privileges form over matter or over the matter-form compound. He makes the form, the soul, the mind, metaphysically prior or more fundamental. A monadology *avant la lettre* is still a monadology." (Brandon C. Look, "Leibniz's Metaphysics and Metametaphysics: Idealism, Realism, and the Nature of Substance," *Philosophy Compass* 5.11 (2010), 877. While I do agree with the idea that we find here a first important move towards the monadology, I do not think that at any point substantial form is metaphysically prior to (primary) matter.

[133] "Si le corps est une substance..." (A II ii 82).

[134] "Qu'afin que le corps ou la matiere..." (A II ii 96).

[135] See, e.g., Martha Brandt Bolton, "Leibniz to Arnauld. Platonic and Aristotelian Themes on Matter and Corporeal Substance," in *Leibniz and His Correspondents*, ed. Paul Lodge (Cambridge: Cambridge University Press, 2004), 99.

extended substances. In his summary this reads as follows: "*That the notions involved in extension contain something imaginary and cannot constitute the substance of body*"[136], and the corresponding paragraph in the *Discourse* claims

> that the notions of size, shape, and motion are not as distinct as is imagined and that they contain something imaginary and relative to our perception, as do (though to a greater extent) color, heat, and other similar qualities, qualities about which one can doubt whether they are truly found in the nature of things outside ourselves. That is why qualities of this kind cannot constitute any substance.[137]

This idea is one Leibniz developed already several years before the *Discourse*. The relativity of motion is based on his claim that it cannot with certainty be attributed to one particular body, but is rather ascribed based on other considerations, predominantly on the question which ascription yields the simplest explanation of the phenomenon.[138] Though he alludes to the vagueness of the terms relating to the modes of extension, this thought plays a less prominent role in the argumentation. Arnauld rather pushes Leibniz towards an explanation of his notion of an aggregate and why he would hold the view that aggregation puts substantiality under threat. The argument Leibniz puts forward is *prima facie* rather simple: There is also something imaginary and mind-dependent that partly constitutes aggregates.[139]

> For let us assume that there are two stones, for instance the diamonds of the Grand Duke and of the Grand Mogul: one and the same collective name may be given to account for both, and it may be said that they are a pair of diamonds, although they are to be found a long way away from each other; but it will not be said that these two diamonds compose one substance. Matters of degree have no place here. If therefore they are brought closer to one another, even to the point of contact, they will not be more substantially united on that account; and even if after contact one were to add some other body calculated to prevent their separating, for example if one were to set them in a single ring, all that will make only what is called 'one by accident'. For it is as though by accident that they

[136] 'Discourse on Metaphysics' (1686) §12, AG 44.
[137] 'Discourse on Metaphysics' (1686) §12, G IV 436/AG 44.
[138] See, for example, 'Motion is something relative' (1977), A VI 4 360/RA 228, and 'Matter and Motion are only Phenomena' (1678-9?), A VI 4 277/RA 256.
[139] This mind-dependence of aggregates here seems to be, at least on the face of it, different from the mind-dependent and imaginary character of extension. The former is mind-dependent insofar it is based on the essential activity of a mind that takes a number of things as belonging together, while the latter is primarily characterized by a lack of clarity in the perceiving mind.

> are forced into one and the same movement. [...] There is as much difference between a substance and such an entity as there is between a man and a community, such as a people, army, society or college, which are moral entities, where something imaginary exists, depend upon the fabrications of our minds. Substantial unity requires a complete, indivisible and naturally indestructible entity, since its concept embraces everything that is to happen to it, which cannot be found in shape or in motion [...], but in a soul or substantial form after the example of what one calls *self*.[140]

Here we find further support for the claim above that soul is the bearer of the complete concept and a substance in its own right. And even though Leibniz later admits that there are degrees of justification for calling certain aggregates 'one', when it comes to real unity, there are no degrees to be found. Hence something is an aggregate regardless of whether its constitutive members are far apart from each other, in contiguity, or even united in a way that ensures common movement over a period of time. But Leibniz also emphasizes that he cannot with certainty ascribe the status of substance to most things, such as the sun or trees. But, he claims, "at least I can say that if there are no bodily substances such as I can accept, it follows that bodies will be no more than true phenomena like the rainbow"[141]. Here again, we see the use of two different notions, 'bodily substances' on the one hand and 'bodies' on the other, but with the restriction to 'bodily substances *such as I can accept*' [my emphasis] and not an outright commitment to a common sense or traditional notion of bodily substances. One possible reasoning behind this claim is that the infinite divisibility of matter of bodies prevents one from arriving at some one thing which can be considered to be a genuine entity, i.e. to arrive at "animate machines whose soul or substantial form creates substantial unity independent of the external union of contiguity. And if there are none, it follows that apart from man there is apparently nothing substantial in the visible world."[142] Without being aggregated of something ultimately real, i.e. real unities, the aggregate itself must lack reality.

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[140] G II 76/LA 94.
[141] G II 77/LA 95.
[142] G II 77/LA 95.

This line of argument is not new to Leibniz's thinking. Already by the end of the 1670s we find a similar argument, though even more explicitly directed against Cartesian extended substance:[143]

(1) What has no greater unity than bricks placed on top of each other is not properly one entity.

(2) It is assumed that there is nothing intelligible in a body other than extension.

(3) Every body is actually divided further bodies.

(C1) There is no such thing as one body.

(C2) There are no bodies.

The argument in this text seems straightforward: Sheer placing next to one another, i.e. mere contiguity, is insufficient for producing an entity. There must be some stronger connection between the parts, if they are to compose a unity at all. Since in bodies there is nothing but extension and its modifications and every extended thing is divisible into extended parts (the Cartesian claim), there is nothing that could account for any connection beyond contiguity of parts. Therefore, nothing that is a merely extended thing is an entity, and since body is defined as a merely extended thing, a body is not an entity. Hence, Leibniz further concludes, either bodies are pure phenomena or the notion of body on which this argument is based is incorrect or at least insufficient. Even though Leibniz is not always explicit on the status of extension, it seems that already throughout these writings, extension is nothing fundamental, primitive or ultimately real, and nothing that plays a grounding role in metaphysics.

The general worry about the unity of extended things is augmented by a related worry at the time of the correspondence with Arnauld. The infinite divisibility or division of extended substance threatens no longer only the unity of extended things, but also their reality: If the reality of the whole is dependent on the reality of its parts, and these parts have parts themselves and are therefore equally dependent on the reality of their parts, then the fact that we do not arrive at

[143] 'There is no such Thing as One Body' (1678-79), A VI 4 278/RA 259-60.

a bottom level there implies a lack of grounding of the reality of the whole we started with.[144]

What gives rise to interpretative problems concerning the concrete status of extension and the nature of bodies is connected to Leibniz's lack of any explicit commitment to a particular ontology.[145] Another source of problems is the fact that Leibniz seems to run together two different arguments for the introduction of substantial forms. One is the argument above, that in order for a composite to be real, all of its parts must be real, because the reality of a composite, if it has any, is dependent on the reality of its parts. But it is important to distinguish this argument from a related one that seems to argue from the unity of corporeal substance, which cannot be bestowed on it by mere extension, to the existence of unifying substantial forms. This latter argument seems to be premised on the assumption that there are at least some corporeal substances: "If there were no composite beings whose unity had to be secured in order for them to be substances, there would be no reason to propose substantial forms to secure their unity."[146] But so far, as we have seen, it seems to be unclear in which sense substantial forms could fulfil this role. It seems, in addition, equally unclear why Leibniz should be seen as requiring such a strong notion of unity in order to motivate his argument for substantial forms: Even if bodies only have phenomenal unity – or even more so –, then some substantial forms, in this case souls, who perceive these bodies as unities and who provide ultimate reason for this phenomenal unity, are required.

Similar to his early *Disputatio*, what Leibniz seems to be presenting to Arnauld is not a definite catalogue of kinds of substances found in the world, but a general definition of substance without any clear commitment to a certain ontology.[147] His definition is supposed to be read as a general description of what it

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144 See Samuel Levey, "On Unity and Simple Substances in Leibniz," *The Leibniz Review* 17 (2007), 61-106.

145 There are many passages which might suggest that Leibniz is in fact in those years committed to corporeal substance, or at least has them as an implicit remainder of his earlier thought looming the background. If that is the case, it is difficult not to ascribe to Leibniz the adherence to several incompatible systems during the years of his correspondence with Arnauld. See Wilson, *Leibniz's Metaphysics: A Historical and Comparative Study*, 79-110.

146 Samuel Levey, "On Unity: Leibniz-Arnauld Revisited," *Philosophical Topics* 31.1-2 (2003), 270.

147 A similar view is indicated by Sleigh, *Leibniz and Arnauld*, 96-97, pointing out that Leibniz seems very aware of the intension of 'individual substance' and the theses following from it.

means to be a substance, and from it the further definitions of individual created substances of certain kinds, such as corporeal or incorporeal substances, would follow: "[A]s the concept of individual substance in general which I have provided is as clear as that of truth, the concept of bodily substance will so also, and consequently that of substantial form"[148]. In opposition to Arnauld's claim that his definition of substance is arbitrary, Leibniz holds that the requirement of true unity is neither arbitrary nor uncommon, but in accordance with those philosophers who "have taken this term more or less in the same way, distinguishing between a unity per se and a unity by accident, substantial form and accidental form, composite substances perfect and imperfect, natural and artificial", but considering "matters at a much more general level, and abandoning the use of terms, I believe that *where there are only entities through aggregation, there will not even be real entities*"[149].

The concern expressed here seems similar to the one of borrowed reality. It is grounded in the worry that if one never arrives at basic unities, the reality of the aggregate lacks a foundation and this lack would render the aggregate a mere phenomenon. But Leibniz connects it here with a worry about the nature of substance as that which possesses a correlating complete concept and this reasoning poses a further problem for aggregates:

> You say you do not see what leads me to admit these substantial forms or rather these bodily substances endowed with true unity; but it is because I cannot conceive of any reality without true unity. And to my way of thinking the concept of an individual substance embraces consequences incompatible with an entity through aggregation; I conceive of properties in substance which cannot be explained by extension, shape or motion[150].

Substances as expressions of the universe are mirroring the works of God and in this way even further increase the perfection of the world. What contains the expression of each individual substance at each moment in time is its complete concept. What is the bearer of the complete concept is the substantial form. Hence it seems as if only substantial forms qualify as substances. But clearly Leibniz assumes that we experience bodies, and their foundation must be explainable

[148] G II 77/LA 95.
[149] G II 96/LA 120.
[150] G II 97/LA 122.

principally without recourse to extension and its modes. Whatever seems to be an extended thing, is at least partly phenomenal, since "everything is strictly indefinite where extension is concerned, and what extension we ascribe to bodies is merely phenomena and abstractions"[151]. Now every human being seems to have an extended body that is somehow connected to his or her soul. But while Leibniz is denying that the property of being extended as well as its shape and motion are more than a phenomenal quality of this body, similar to its colour, he is more reluctant on giving a definite answer what the ultimate constitution of this body is. "However, although it is possible that the soul has a body made up of parts animated by separate souls, the soul or form of the whole is not on that account made up of the souls or forms of the parts."[152] These claims fit in neatly with the independence of substantial forms and the worry that bodies cannot be aggregates of bodily parts informed by their own substantial forms and united by a soul.

The status of the soul as a substance seems very clear by now; the status and constitution of the body much less so. But, Leibniz emphasises, while the body might be made up of parts of some kind, the soul is not. He seems to stress that while the body might be an aggregate of animated parts, the soul clearly is not. This emphasis is demanded by the notion of an aggregate already touched upon. Even though Leibniz accepts that there are degrees of accidental unity, for example that we are correct in ascribing more unity to an ordered society than to a 'chaotic mob', "all these unities are made complete only by thoughts and appearances, like colors and other phenomena, which one nevertheless calls real"[153]:

> Our mind notices or conceives of certain genuine substances which have various modes; these modes embrace relationships with other substances, from which the mind takes the opportunity to link them together in thought and to enter into the account one name for all these things together, which makes for convenience in reasoning. But one must not let oneself be deceived and make of them so many substances or truly real entities; that is only for those who stop at appearances, or those who make realities out of all abstractions of the mind, and who conceive of number, time, place, movement, shape, perceptible qualities as so many separate entities. Whereas I maintain that one cannot find a better way of

[151] G II 99/LA 124.
[152] G II 100/LA 125.
[153] G II 100/LA 126.

> restoring the prestige of philosophy and transforming it into something precise than by distinguishing the only substances or complete entities, endowed with genuine unity, with their different states which follow one another; all the rest is merely phenomena, abstractions or relationships.[154]

According to this picture, the connection between a soul and its body seems to be not as close as one might expect, the soul far from having a relationship to the body that would allow to talk about the composite of the two as a real unity. The understanding of the relation between a mind and its own body as well as all other bodies is further deepened by the explanation of the notion of expression. "One thing expresses another (in my terminology) when there exists a constant and fixed relationship between what can be said of one and of the other. [...] Expression is common to all forms, and it is a genus of which natural perception, animal sensation and intellectual knowledge are species"[155]. The knowledge concerning our body is based on the correspondence of certain more or less confused perceptions in our soul with all the movements of our body. But even though we have a closer, i.e. more immediate, perceptual connection to our body, it does not seem that this entails the claim that we form a substance or real unity with it. This is illustrated by Leibniz's example of the connection between an act of willing and the corresponding movement: "my hand moves not because I will it to do so (for it is useless for me to will a mountain to move [...]) but because I could not will it with success, except at the precise moment that the elasticity in my hand is about to slacken in the requisite way to achieve this result"[156]. The main difference between my body and a mountain, or any other corporeal object distinct from my body, seems to be a closer correspondence of the former with the expressions in my soul, but without rendering it a part of myself or the substance that is me. It remains an object external to me and related to myself, like the assumed mountain is, by the expressions I find within my soul.

While Leibniz prefers to talk about 'bodies' and 'bodily substances', Arnauld is concerned rather with 'matter' and wonders how the conjunction with a soul could render it one entity, whilst matter as such is infinitely divisible and hence

[154] G II 101/LA 126-27.
[155] G II 112/LA 144.
[156] G II 116/LA 149.

lacks any worthwhile notion of unity. Leibniz's answer to this query indicates that there are two ways of conceiving of matter, either as a component of the substance or abstracted from it.

> I answer that it is the animate substance to which this matter belongs which is truly an entity, and the matter considered as a mass in itself is only a pure phenomenon or a well-founded appearance, as also are space and time. It has not even precise, fixed qualities which can give it the appearance of a specific entity.[157]

This is due to the fact that it neither can have a precise shape due to the infinite divisibility of matter, nor that motion and magnitude are less phenomenal than colours or sounds, and if there would be extended mass constituted only by such qualities, it would only be a phenomenon. "[I]t is form which gives determinate being to matter [...]. Only indivisible substances and their different states are absolutely real."[158]

Leibniz later added to the manuscript the following supplement:

> But if one considers as matter of bodily substance not formless mass but a second matter which is the multiplicity of substances of which the mass is that of the total body, it may be said that these substances are parts of this matter, just as those which enter into our body form part of it, for as our body is the matter, and the soul is the form of our substance, it is the same with other bodily substances. [...] The problems that are raised on these topics originate inter alia from the absence usually of a distinct enough concept of the whole and the part, which basically is nothing else but an immediate requisite of the whole, and in a way homogeneous. Thus parts can constitute a whole, whether it has a genuine unity or not. It is true that the whole which has a genuine unity can remain strictly the same individual, although it loses or gains parts, as we experience in ourselves; thus the parts are only temporarily immediate requisites. But if one were to understand by the term 'matter' something that is always essential to the same substance, one might in the sense of certain Scholastics understand thereby the principle of passive power of a substance, and in this sense matter would not be extended or divisible, although it would be the principle of divisibility or of that which amounts to it in the substance.[159]

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[157] G II 118-19/LA 152.
[158] ibid.
[159] G II 119-20/LA 153-54.

We will encounter similar thoughts a few years later in writings that deal with simple substances. Hence it might be argued that this later addition was made after a shift in Leibniz's thinking had already taken place, even though Leibniz clearly thinks that this addendum sits well with the rest of the text. It introduces a distinction that might indeed make things clearer. On the one hand, one might talk about man as "an entity endowed with a genuine unity conferred on him by his soul, notwithstanding the fact that the mass of his body is divided into organs, vessels, humours, spirits, and that the parts are undoubtedly full of an infinite number of other bodily substances endowed with their own entelechies"[160], but this does not amount to saying that man is a real unity or substance composed of a soul and a body. This body itself, even though it might be the body of a human being, might not be a real unity at all. In his last letter to Arnauld, written in 1690, Leibniz claims that it is this notion of body that has been the subject of the thoughts he has shared with Arnauld in their correspondence, and it is a thought similar to the one we have already encountered in the argument against Cartesian extended substance from the late 1670s: "Body is an aggregate of substances, and is not a substance properly speaking."[161]

But does this stand in opposition to Leibniz's frequent use of the notion of 'corporeal substance' or 'bodily substance'? Not necessarily. Already a few years before the correspondence, Leibniz entertained the idea that corporeality is independent of extension and that corporeal substances are constituted differently and possess different essential attributes than usually assumed by his contemporaries:

> Extension does not belong to the substance of a body, and neither does motion, but only *matter*, i.e. the principle of passion or of a limited nature, and form, i.e. the principle of action or of unlimited nature. For every created thing contains both the limited and the unlimited: the limited in respect of distinct cognition, and the irresistible power, and the unlimited in respect of confused cognition and of diffused action. For every soul, or rather every corporeal substance, is confusedly omniscient and diffusedly omnipotent. [...] Every created thing has matter and form, i.e. is corporeal.[162]

[160] G II 120/LA 154.
[161] G II 135/LA 170.
[162] 'Wonders concerning the Nature of Corporeal Substance' (1683), A VI iv 279/RA 265.

Now we shall take a look at how this claim that matter as the passive principle of a limited form, rather than extension, belongs to the nature of corporeal substance.

3. The Metaphysics of Simple Substance

3.1. Simple Substances and Substantial Forms

Regardless of the question to what extent simple substances can be traced back to Leibniz's writings of the 1680s or even earlier, there is a rather decisive moment that encourages the ascription of a simple substance ontology in the mid-1690s. In these years, the possibly first time Leibniz explicitly mentions simple substances, is in a defence of his metaphysics, which were put forward in the 'New System' (1695) against objections that were raised by Simon Foucher. In this response he claims that "in actual substantial things, the whole is a result or coming together of simple substances, or rather of a multitude of real unities."[163] While this is clearly a tremendous step towards, if not an arrival at, the substances later to be termed 'monads'[164], it is less clear when exactly the idea as such arises. Therefore, it will prove useful to look at the wider context, which culminates in this explicit adoption of a simple substance ontology (while leaving for the moment undecided whether this is an ontology that contains exclusively simple substances or one that allows for other substances, e.g. corporeal substances, as well).

What seems to be the main, if not only, criterion for simplicity by the time of the *Monadology* is the impossibility of being resolved into parts, i.e. partlessness: "The monad […] is nothing but a simple substance that enters into composites –

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[163] 'Note on Foucher' (1695), G IV 491/AG 146. For the claim that from 1695 on Leibniz speaks increasingly of 'simple substances', see also Antognazza, *Leibniz. An Intellectual Biography*, 352. One possible exception is to be found in Leibniz's summary of the 'Discourse on Metaphysics' written for Arnauld: "35. Excellence of minds: that God considers them in preference to the other creatures; that minds are an expression of God rather than of the world, and that the other simple substances [*les autres substances simples*] are an expression of the world rather than of God." (G II 14/LA 8.) But considering the paragraph in the *Discourse* this passage is summarising, 'simple' seems to refer here to a limitation of the mental capacities and the ability to gain knowledge. But this addition has been made by Leibniz subsequent to the original composition of the letter (cf. A II ii 7). Therefore it cannot be regarded as an indication that Leibniz held a simple substance ontology by the time of the correspondence with Arnauld. But it shows that Leibniz considered this letter exchange significant enough for and compatible with later amendments and hence compatible with his later metaphysical system.

[164] Since the "real unities" are equated with "monads" in a letter to l'Hôpital from July 1695 (GM II 297/WF 57), we might with some right assume that the mid-1690s also constitute Leibniz's arrival at his monadological metaphysics. See also Antognazza, *Leibniz. An Intellectual Biography*, 352.

simple, that is without parts."[165] Already in some notes on a conversation Leibniz had with Fardella[166], written down in 1690, Leibniz gives an argument similar to the one he will later suggest in the *Monadology* and elsewhere as to why there must be more fundamental substances that constitute bodies. Body, Leibniz reasons, "is an aggregate of substances, since it is always further divisible"[167], but as such it can only be real if there are substances that are truly one and indivisible, and which form the basis for a body's constitution. Such indivisible substances are characterized not by being a part of a body they compose, but "rather as an essential, internal requisite, just as one grants that a point is not a part that makes up a line, but rather something of a different sort which is, nevertheless, necessarily required for the line to be, and to be understood"[168]. Because these 'internal requisites' are not parts of the aggregate, they do not need to be homogeneous with the whole, i.e. they do not need to share the properties of the whole. In the case of parts, there must be some property that forms the basis for regarding all these parts as belonging to the same whole.[169] But in the case of simple substances as the foundation for aggregates, this requirement – due to the denial that they are parts of the whole – is not necessarily entailed. They can, therefore, differ in fundamental respects, and indeed even in all respects, even though, as we will see, at least the well-founded properties of the whole might need to supervene in some sense on the properties of its constituents.[170]

The parts of a merely extended substance, on the contrary, must themselves be extended, and, for Leibniz at least, therefore also infinitely divisible. This supposition is, in Leibniz's view, as true for Cartesian *res extensa* as it is for the smallest, only allegedly indivisible particles of the atomists and corpuscularians.[171] But this supposition by itself does not contain any rejection of extension as such.

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165 'Monadology' (1714) §1, G VI 607/AG 213.
166 'Notes on Fardella' (1690), AG 101-105.
167 ibid., AG 103.
168 'Notes on Fardella' (1690), AG 103. For a discussion of the notion of 'being in' ['inesse'], see especially Donald Rutherford, "Leibniz's "Analysis of Multitude and Phenomena into Unities and Reality"," *Journal of the History of Philosophy* 28.4 (1990).
169 We have already seen a similar thought being in place at the time of 'De arte combinatoria', where Leibniz spells out the criterion for regarding something as a 'whole' to be the possession of any common property that provides the reason for subsuming things under a common term.
170 See chapter 4.
171 See, e.g., 'New System' (1695), G IV 482/WF 16. These smallest particles are only allegedly indivisible since they are extended, have parts and are, therefore, at least in principle, divisible.

Even though what is extended is divisible, this does not mean that anything that is extended cannot be such a fundamental unity. It only means that anything that is *nothing but* extended can function as such a unity, since it will always be further divisible. This leaves open the possibility that some unifying principle might be added to this extended, divisible matter in order to achieve such a unity. But we have already seen that there are independent grounds for assuming that extended objects are, for Leibniz at least, highly suspicious and that details of how the unifying by a substantial form or by any other means available to Leibniz could proceed is difficult to comprehend.

This possibility of a further principle added to mere extension seems also to be ruled out by the illustration Leibniz chooses in order to motivate the existence and to explain nature of these requisites. The paradigmatic case of such a fundamental substance is introduced now by reference to introspection. The reference to one's own experience as an 'I' is used to suggest the existence of a single, indivisible substance, which cannot be resolved into any further parts or substances.

This 'I' is, in addition, the permanent subject of one's actions and passions, and hence necessarily persisting over and above the changeable human body that is attached to it: "Hence, since I am truly a single indivisible substance, unresolvable into many others, the permanent and constant subject of my actions and passions, it is necessary that there be a persisting individual substance over and above the organic body."[172]

This is a clear reference back to the Aristotelian notion of substance as the ultimate subject of predication in its strict sense that Leibniz has already utilized as the basis of the complete concept theory in the 1680s. Based on this list of properties that the 'I' as a paradigmatic substance possesses, Leibniz concludes that "there must be some incorporeal, immortal substance in man, over and above the body, something, indeed, incapable of being resolved into parts."[173] Clearly, the 'I' as experienced through introspection shows remarkable resemblance, not least due to the emphasis on being 'unresolvable' and a 'permanent subject', with the mind-like simple substances of the monadology and it is present already in this text

[172] 'Notes on Fardella' (1690), AG 104.
[173] ibid.

dating back to 1690. It is also worth noting that Leibniz regards this indivisible substance as being "completely different from the nature of body", since it is "incorporeal" and "immortal"[174]. And even though this sounds remarkably similar to how one might describe a monad and as if Leibniz is suggesting that this indivisible substance is the soul or whatever corresponds to the soul in animals and plants, when pressed by Fardella he is eager to record that the soul as such is not a substance but "a substantial form, or the primitive form existing in substances, the first act, the first active faculty"[175]. We have already encountered this apparent ambiguity or indecision on Leibniz's part in the 1680s, where he equally vacillated between the suggestion that souls are substances and the rejection or moderation of this claim. And again, we might be able to employ the same reasoning in order to resolve this tension and suggest that what Leibniz has in mind is that an indivisible substance is not exclusively constituted by a substantial form[176] (even though Leibniz is here silent on what else it might be that enters into the substance), but also that it is neither corporeal (since it is qualified as 'incorporeal') nor resolvable into further parts (since it is a fundamental unity, though the partlessness might already suggested by its incorporeality). On the one hand, being 'incapable of being resolved into parts' is not necessarily equivalent to being 'without parts' (i.e. simple), since there might be a sense in which something can have inseparable parts; but given the assumption that for two things to stand in a parthood relation to one another homogeneity and separability are required, not being resolvable into parts seems to entail the absence of parts altogether and therefore partlessness.

[174] ibid. It is hard to see how these 'incorporeal' substances, which are, in addition, 'completely different in nature from the nature of bodies', and therefore presumably also not extended, could be somehow similar to paradigmatic Aristotelian substances such as the horse Bucephalos or the man Socrates.
[175] ibid., AG 105.
[176] One might claim that Leibniz is just not careful in distinguishing between substance and substantial form in the present context. Robert Adams, for example, suggests that in order to gain a consistent reading of the Fardella memo, 'soul' and 'substance' need to be treated partly as equivalent, partly as distinct. (Adams, *Leibniz. Determinist, Theist, Idealist*, 275-276.) But this seems implausible given that this is a relatively short text and that the importance of this distinction is explicitly raised. Therefore, also readings that see the origin of simple substances in the mere resolution of matter into forms and hence into simple substances, e.g. Levey, "On Unity and Simple Substances in Leibniz", seem to be misguided.

But this text itself is too short to paint a clear picture. And Leibniz himself complicates things at the end of this text by claiming that

> [f]or *if a man is the I* [*Ego*] itself, then he cannot be divided, nor can he perish, nor is he a homogeneous part of matter. But if by the name 'man' one understands that which perishes, then a man would be part of matter, whereas that which is truly indestructible would be called 'soul,' 'mind,' or 'I,' which would not be a part of matter.[177]

Here we might have a hint at a possibly worry of Leibniz concerning Fardella's understanding of the notion of substance such that he feels the need to distinguish a more common notion of the substance 'man' as an individual material, animate being from 'man' considered under his own, stricter notion of an indestructible, incorporeal substance, at this point taken to be the substantial form only. He could be seen to equate the 'I' as the paradigm of an indivisible substance with 'soul' and hence substantial form.[178] Or one might claim that what Leibniz is doing in this and other texts of the time is that when he "talks about corporeal substances [...], he *means* corporeal substances: the unity of a soul or form and a body or matter, understood in very roughly the way the terms would have been used by an Aristotelian of his day."[179] Such a reading suggests that substantial forms are necessarily the forms of a body and hence that corporeal substances are "substances, though complex and made up of smaller substances, bugs in bugs, are, nevertheless, indivisible."[180] The Fardella Memo, taken by itself, seems to be too vague concerning the concrete constitution of bodies in order to identify reliably the underlying metaphysical structure of substances. But is the use of Aristotelian language sufficient to motivate such a reading of the Fardella Memo in the first place? It seems that the answer to this question has to be negative, since Leibniz continues to employ an 'Aristotelian' language frequently in his monadological writings as well, not the least by allowing that "[o]ne can call all simple substances or created monads entelechies"[181] or by continuing to describe the constitution of

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[177] 'Notes on Fardella' (1690), AG 105.
[178] See Adams, *Leibniz. Determinist, Theist, Idealist*, 275.
[179] Garber, *Leibniz. Body, Substance, Monad*, 92.
[180] ibid., 84.
[181] Mon §18, G VI 609-10/AG 215.

monads in terms of matter and form[182]. Due to a lack of clarity in the notes on Fardella, it might be wise to postpone a judgment until we have looked at further texts of this time, which might be more explicit on this question.

A more direct reference to simple substances can be found in the 'New System', where Leibniz describes the fundamental "atoms of substance" as "real unities *absolutely destitute of parts*"[183]. While the notion of an atom entails the idea of something indivisible, which might have been a component of Leibniz's notion of substance that was in place before the 1690s, the notion of being 'absolutely destitute of parts' is a clear indication of partlessness, simple substances. The argument he employs in order to establish these 'atoms of substance' is similar to the one found in the Fardella Memo, namely that the principles of real unity cannot be found in matter, since matter is divisible to infinity and, also in accordance with the interchangeabililty of being and unity[184], the reality of a multitude – due to not being a genuine unity and hence not being a genuine being by itself – is only to be derived from true unities.

> Therefore, in order to find these *real entities* I was forced to have recourse to a formal atom, since a material thing cannot be both material and, at the same time, perfectly indivisible, that is, endowed with a true unity [later changed by Leibniz to: 'Therefore, in order to find these *real unities*, I was forced to have recourse to a *real and animated point*, so to speak, or to an atom of substance which must include something of form or activity to make a complete being']. Hence, it was necessary to restore, and, as it were, to rehabilitate the *substantial forms* which are in such disrepute today, but in a way that would render them intelligible, and separate the use one should make of them from the abuse that has been made of them. I found then that their nature consists in force, and that from this there follows something analogous to sensation and appetite, so that we must conceive of them on the model of the notion we have of *souls*.[185]

But we have to proceed carefully here. It remained open in the Fardella Memo whether substances and substantial forms amount to the same, and a similar question arises with respect to this passage. In the printed version of the *New*

[182] E.g. in his correspondence with De Volder and Des Bosses.
[183] 'New System' (1695), G IV 482/AG 142, my emphasis.
[184] G II 97/LA 121.
[185] 'New System' (1695), G IV 478-79/AG 139.

System, the real entities that are the basis for reality of bodies are 'formal atoms'. This would suggest that they are essentially forms, while matter or any material aspect, on the other hand, seems to be dismissed as not capable of playing a role in the constitution of such an indivisible substance. The immediately following passage would then suggest that this formal atom was identical with the substantial form and that its nature would consist in force. But this is by no means the only way to understand this passage. The crucial question in order to make sense of it is: What does 'material thing' mean here? Earlier in the text, Leibniz justifies his motivation for the rehabilitation of substantial forms with the difficulty of finding "*the principles of a true unity* in matter alone, or in what is only passive, since everything in it is only a collection or aggregation of parts to infinity"[186] or of placing unity in "*extended mass* alone"[187]. Matter seems to be here used less as a technical term, but rather aiming indiscriminately at Cartesian *res extensa* and at the notions of matter prevailing in general in early modern mechanical philosophy. With a denial of matter taken in this sense, formal atoms would be perfectly compatible with containing matter in a different sense, e.g. Leibnizian primary matter as a negation or privation. But more revealing is the amendment made by Leibniz later, which suggests that he came to realize that the term 'formal atom' might be misleading, inappropriate or at least not necessarily required, and is to be replaced with 'real and animated point', while at the same time any explicit mention of 'matter' is dropped. Instead, some form or activity is introduced, which makes this fundamental substance a complete being. Since this form only completes the substance, it seems that something else is required which enters with the form into the complete substance. The most obvious candidate would be some kind of matter. But the fact that 'matter' is the most obvious candidate for something that might complete 'form' does not mean that this 'matter' is equivalent to the Cartesian *res extensa* or traditional early modern matter, both of which have been criticized earlier in the *New System*. Neither does it have to be some kind of Aristotelian matter. Given the later amendment and the dropping of what seems to be matter in all these senses, it appears to be the case that if there were some kind of matter in Leibniz's mind at this point, as the second notion involved in the

[186] ibid., G IV 478/AG 139.
[187] ibid.

completion of a substance, it is probably some kind of primary matter in Leibniz's own, specific sense, and something that is essentially unextended.

Since these 'true unities' are 'absolutely destitute of parts', and not merely indivisible, neither form nor matter can be *parts* of a substance emerging from this union, i.e. they cannot be separable or really distinct. And, in addition, if one emphasises the *absolute* nature of the partlessness indicated here, neither of them seems capable of having parts by themselves. This view is also supported by the description of these real unities as 'points': These emerging unities can also be referred to as 'metaphysical points', which are contrasted with physical points that would be the result of a contraction of a corporeal substance. Such "physical points are indivisible only in appearance […]. Only metaphysical points or points of substance (constituted by forms or souls) are exact and real, and without them there would be nothing real, since without true unities there would be no multitude."[188] Presumably, physical points are indivisible only in appearance, because they are still extended. In contrast, the 'metaphysical points' are truly indivisible and, arguably, therefore also unextended. This would suggest that if there is matter involved in the constitution of a substance, it is significantly different from the matter as the merely extended, or at all extended, mass that was introduced earlier in the 'New System'.

Such a different notion of matter, in return, does not give rise to the problem which was the starting point of Leibniz's argument for simple substances, namely the worry how something that essentially has parts (if what it means to be extended is to have "parts inside parts"[189], to be 'divisible into parts' or to be 'composed of parts') can enter into something that is essentially destitute of parts or into something that is a true unity. On the account presented here, the question of what unifies the most fundamental substance does not need to be asked, since its constituents do not stand in the relation of parts that enter into a common whole to each other nor do they themselves consist of any parts. A substance constituted in this way is *qua* its constitution simple, i.e. without parts, and a genuine unity and hence does not require a unifying principle that ensures and

[188] ibid., G IV 483/AG 142.
[189] Descartes to Henry More, 5 February 1649, in *The Philosophical Writings of Descartes. Volume 3*, trans. John Cottingham et al. (Cambridge: Cambridge University Press, 1991), 364.

upholds this unity. But Leibniz does not seem to be overly eager in this writing to explain in great detail how these real unities are constituted, but keener on introducing his solution for the mind-body-problem in form of the pre-established harmony and emphasizing the shortcomings of Cartesian and Occasionalist solutions. (He seems to have saved the task of a deeper analysis of the constitution of substances for the 'Specimen Dynamicum'; see chapter 4.)

Also Foucher seems to have read Leibniz as claiming that his fundamental substances are unextended things, since he agrees with Leibniz that extension requires unities, but he claims, in difference to Leibniz, that these unities cannot possibly be points, since points as unextended entities could not constitute any extension at all.[190] And Leibniz does not show any indication that he wants to disabuse his fellow philosopher of the opinion that his view is indeed that the most fundamental substances are unextended. Pressed on this issue, Leibniz only denies that these fundamental substances form parts from which any extended thing could be composed. Hence he is implicitly reiterating that the parts of an extended object must themselves be extended. But he suggests, in addition, that extension is not a wholly or truly real thing, but rather puts it in the same ontological category as space and claims that they are both only systems of relations.[191] Given Leibniz's view on relations, it is clear why extension would not be fully real, but reducible to or grounded in intrinsic states of substances that stand in some way in the relation of extension to each other.

In general, Leibniz points out, there are different criteria for parthood and for foundation. Concrete things are wholes composed of parts and are the result of the coming together of their individual parts, which must therefore be prior to the whole. Ideal wholes, such as space and mathematical extension, on the other hand, are prior to any parts that we might conceive in them. A concrete whole such as a herd, for example, can only exist if the individual sheep exist. But this analogy merely illustrates how an aggregate is in its reality dependent on the existence of its

190 'Reply of M. S. F. to M. de L. B. Z. on his New System of the Communication between Substances, Proposed in the Journals of 27 June and 4 July 1695' (Journal des savants, 12 September 1695), G I 424-25/WF 41.

191 'Note on Foucher's Objection' (1695), G IV 491/AG 146. This is a stronger claim than the one we have already encountered in the 'Discourse' (1686), where Leibniz claimed that there is 'something imaginary' in extension.

constituents. But this is not where Leibniz stops. He goes on to point out that each individual sheep is itself composed of parts, each of which has parts itself, and so on to infinity. But from this, so the claim, follows that there must be true unities: "Although this [i.e. parts being divisible into further parts] goes on to infinity, it is evident that, in the end, everything reduces [*revenir à*] to these unities, the rest of the results being nothing but well-founded phenomena."[192]

Therefore, any aggregate, and hence bodies as aggregates, are in their reality dependent on fundamental, indivisible unities from which they derive their reality. But the mere existence of indivisible unities seems insufficient for an account of aggregates. There is, therefore, another aspect that comes into play in their formation. An aggregate, as Leibniz has already discussed it in the 1660s in the realm of his art of combination and holds, still or again, in the early 1690s, is, in addition to being dependent on unities, also essentially dependent on an aggregating mind:

> [F]or an aggregate it is sufficient that many beings distinct from it, are understood to agree in a similar way with respect to it; namely if A, B, C are considered in the same way, and by that [consideration] L is understood to be established, A, B, C will be the things aggregated and L the whole made by the aggregation.[193]

It seems, therefore, not even to be required that the aggregates themselves are unified in any other way than by being grouped and perceived together by some mind. In this sense, the parts of an extended aggregated whole are 'one' first and foremost because they are perceived by the mind as belonging together, rather than because they form by themselves a whole. This might entail the worry that for Leibniz our perceptions are to a great extent unreliable: Even though we perceive something as a composed or aggregated, i.e. as a body which has a stronger unity than other objects that are merely arbitrarily taken together, what there indeed and truly is, is something unrelated before the operations of the mind. But there is an argument Leibniz puts forward against the charge that God would deceive us if

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[192] 'Note on Foucher's Objection' (1695), G IV 492/AG 147.
[193] A VI iv 998 (1689-90), as quoted in Paul Lodge, "Leibniz's Notion of an Aggregate", 469-70. This bears a remarkable similarity with Leibniz's views in the 1660s on the composition of wholes, see 1.2.1.

things that seem to interact do not in fact interact at all, which could also be employed in the case of extension and the unity of aggregates: "God is not obliged to make a system about which we could not make mistakes, just as he was not obliged to avoid the system of the moving earth in order to save us from the error into which nearly all astronomers fell before Copernicus."[194] Leibniz is especially critical of Descartes' proof for the existence of the material things based on the fact that God is not a deceiver.[195] Neither is it necessary that being deceived is disadvantageous for us nor does the source of deception ever lie outside ourselves: Since being deceived in believing in the existence of material extended objects independent of our own mind would be based on the judgment that the cause of perception lies outside of us and that these objects are constituted in the way we perceive them to be, and since this judgement originates in us, the deception does as well.[196]

Given the amount of uncertainty that Leibniz shows as to what the nature of extension could amount to and as to how reliable our perception is as a source of metaphysical knowledge, one might wonder what notion of substance he exactly has in mind. In a contribution to the *Acta eruditorum* in March of 1694, entitled 'On the Correction of Metaphysics and the Concept of Substance'[197], he accuses Descartes of having an insufficient understanding of the general terms used in metaphysics as well as of the nature of substance and that he, Descartes, due to these shortcomings, "absurdly put the nature of corporeal substance in extension"[198]. There are two aspects of Descartes' philosophy Leibniz rejects in this passage. One of them is any characterisation of a kind of substance as essentially

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194 'Remarks on Foucher' (1695), G IV 493/WF 47.

195 See Descartes, Fourth Meditation, in *The Philosophical Writings of Descartes. Volume 2*, trans. John Cottingham et al. (Cambridge: Cambridge University Press, 1984), 44-49.

196 'Critical Thoughts on the General Part of the Principles of Descartes' (1692), G IV 366-67/L 391-92. In fact, Descartes would agree with Leibniz that the source of error will be internal to us and not due to a deceptive act on God's part. But he would disagree with the claim that the essence of body cannot be extension.

197 'On the Correction of Metaphysics' (1694), G IV 468-70/L 432-34.

198 'On the Correction of Metaphysics' (1694), G IV 469/L432; this claim is not new or peculiar to the 1690s. Already in the Discourse on Metaphysics, Leibniz claimed that the notions involved in extension, i.e. shape, size and motion, "contain something imaginary and relative to our perception, as do (though to a greater extent) color, heat, and other similar qualities, qualities about which one can doubt whether they are truly found in the nature of things outside ourselves. That is why qualities of this kind cannot constitute any substance." ('Discourse on Metaphysics' (1686) §12, G IV 436/AG 44).

extended, which seems in turn to be derived from Leibniz's general conviction that "the concept of *forces* or *powers*, which the Germans call *Kraft* and the French *la force*, and for whose explanation I have set up a distinct science of *dynamics*, brings the strongest light to bear upon our understanding of the true concept of *substance*."[199]

By now, it should not be of any surprise that Leibnizian substances are fundamentally active and hence that the notion of force plays an important part in their constitution. And, as we have seen above, in order to ensure this essential activity, Leibniz feels forced to "rehabilitate the *substantial forms*"[200]. But this emphasis on the essential activity of substances leads Leibniz further to a denial of extension as a part of the essence of corporeal substance at all:

> I say that this power of acting inheres in all substance and that some action always arises from it, so that the corporeal substance itself does not, any more than spiritual substance, ever cease to act. This seems not to have been perceived clearly by those who have found the essence of bodies to be in extension, alone or together with the addition of impenetrability, and who seem to conceive of bodies as absolutely at rest. It will be apparent from our meditations that one created substance receives from another created substance, not the force of acting itself, but only the limits and the determination of its own pre-existent striving or power of action.[201]

Not only is extension not to be regarded as essential to corporeal substance, Leibniz indicates here moreover that the *only* property required for adequately describing substances is its essential activity and the limitation thereof. But what might give us an occasion to pause is the distinction between 'corporeal' and 'spiritual' substances. It seems to suggest that the underlying ontology is comprised of at least two different types of objects, corporeal substances and spiritual substances, both of which – *qua* being substance – need to be active. Equally well, though, one might read the passage as suggesting that corporeal substances do not cease to act since they are fundamentally composed of active, 'spiritual' substances. Hence the constant action of the latter would show itself in the constitution of the former. Therefore, even though some corporeal substances seem to us as being at rest at some points in time, once we have gained insight into their fundamental constitution, we realize that there must nonetheless be constant activity and hence

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[199] 'On the Correction of Metaphysics' (1694), G IV 469/L 433.
[200] 'New System' (1695), G IV 478-79/AG 139.
[201] 'On the Correction of Metaphysics' (1694), G IV 470/L 433.

motion. This text, like most others of the early to mid-1690s, is not by itself decisive on the constitution of substance, but if we focus on what other passages we have already looked at indicate, we might get a clearer picture.

But the first fundamental question that still has not been sufficiently answered needs yet to be addressed, namely that concerning the relation between substantial forms and substances. While in some passages Leibniz clearly distinguishes them, there are others where he seemingly equates both notions. The passages here might give an answer that does not rely on ascribing an overly ambiguous use of terms to Leibniz. First and foremost, substances in Leibniz's system are characterized by their activity. In this way, it does seem reasonable to identify a substance merely with its substantial form, i.e. with its principle of activity. But while a (created) substance is fundamentally active, it is also limited in this activity, i.e., it is not God-like, and this limitation arises in some way due to the presence of other substances. But in the system of pre-established harmony, there is no causal interaction between substances. Therefore, this limitation in activity cannot be causally introduced from the outside, but must lie within the limited substance itself. And taking this limitation into account would constitute a different way at looking at a created substance. Therefore, when looking at an (essentially active) substance, one can also consider the limitations imposed on its activity, not as limitations imposed on it from something distinct from it, but as the internally arising limitations of the substance's essential activity itself. (The only way in which other substances might indirectly limit the activity of the substance in question would be due to the requirements of pre-established harmony that allows the construction of internal states of a substance as a mirroring or expressing of the states of all other substances in the universe.) These self-imposed limitations do not seem to add another positive constituent to the substance, but merely hinder its primary, active aspect in the full enforcement or development of its abilities. Hence we can view substances also as that which is the substantial form with its limitations.[202] Having possibly this view in mind, Leibniz writes to Bossuet in 1694, that "I do not see that it is possible to find in substances anything more basic than

[202] See also Antognazza, "Primary Matter, Primitive Passive Power, and Creaturely Limitation", and Duarte, "Leibniz and Prime Matter".

the principle of all of that – that is, than force."[203] Here we do not find any indication that there are two components of substance, an active substantial form united with a somehow Aristotelian matter or any other additional passive constituent, but rather the view that there ultimately are only (limited) substantial forms. This allows Leibniz, to some extent, to use substantial form and substance interchangeably, depending on whether the focus lies on the essential activity of substance or on its limited and imperfect character. And this essential activity is furthermore the only positive component of the substance. Its limitation, on the other hand, though it can be termed 'matter' (or, more precisely, 'primary matter' or 'primitive passive power') due to its opposition to 'form', is not a distinct incomplete being that enters into the composition of substance in order to constitute the counterpart to the equally incomplete substantial form.[204] And these simple substances are the most basic constituents of the world: "The key to my doctrine on this subject consists in the consideration of [...] that which is genuinely a real unity, a monad."[205]

Further support for this view might be drawn from one of the rare texts by Leibniz that were written in German. In *Von der wahren Theologia Mystica*[206] he explains the origin of creatures and their limitations while attempting to avoid the conclusion that God is the source of any evil:

> Their [i.e. the creatures'] self-being [Selbstwesen] is of God, their nonbeing [Unwesen] is of nothing. (Numbers too show this in a wonderful way, and the essences of things are like numbers.)
> No creature can be without nonbeing; otherwise it would be God. Angels and saints must have it.[207]

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[203] To Bossuet, 'Reflections on the Advancement of True Metaphysics' (1694), WF 35.
[204] For a radically different view on what the incompleteness of form and matter amounts to, namely as a sign for the ineliminable status of matter in a physicalistic sense, see Andreas Blank, "Incomplete Entities, Natural Non-Separability, and Leibniz's Reply to François Lamy's *De la conoissance de soi-même*," *The Leibniz Review* 13 (2003).
[205] To l'Hôpital, July 1695, GM II 297/WF 57.
[206] DS I 410-13/L 367-370. [Loemker dates this text 1690 (?), but that seems a bit too early – also since it has not yet been published in the Akademieausgabe.] Ross estimates the composition date to be 1696, because it includes a reference of the constitution of substance to the binary system, in which Leibniz was interested predominantly in the mid-1690s. (See George MacDonald Ross, "Leibniz and Renaissance Neoplatonism," in *Leibniz: Critical Assessments*, ed. Roger S. Woolhouse (Routledge: London, 1994), 500, note 31. Loemker translates 'Selbstbestand' as 'substance' and 'Unwesen' as 'nonbeing', while he regards the latter to stand for 'matter' (L 367) without qualification. The connotation of the former seems to be better captured by 'self-subsistence' or 'self-being'. The notion of 'Unwesen' in German seems to, in addition, have a slightly negative connotation.
[207] DS I 411/L 368.

Here Leibniz seems to suggest something similar to the interpretation given above. Substance or 'self-being' [*Selbstwesen*] is essentially limited by the absence of something, i.e. by some kind of nonbeing [*Unwesen*]. While a creature's perfections come from God, its essential and original limitation does not. Given the orthodox view, God is pure act and absolutely perfect, without any passivity or limitation. Hence the natural reading of nonbeing here is as referring to whatever is absent in God, i.e. to passivity and limitation. As nonbeing these limitations (and the moral failures of creatures originating from them) are not created at all – since they have no being – and therefore cannot be attributed to God as their source. And, as nonbeing, they also cannot form a positive or 'real' constituent of creaturely substances. Similarly, in the 'Dialogue effectif' from 1695 Leibniz claims that all created things "are bounded or imperfect by virtue of the principle of negation or of nothingness they contain, by virtue of the lack of an infinity of perfections in them"[208]. But this view is by no means original to Leibniz's philosophy in the 1690s. Already in the *Discourse*, we find the idea that limitation and privation originate from nonbeing: "And it is to this [i.e. an original imperfection or limitation connatural to all creatures], in my view, that we must reduce the opinion of Saint Augustine and other authors, the opinion that the root of evil is in nothingness, that is to say, in the privation or limitation of creatures"[209]. We see that in Leibniz's philosophy there is an intimate relationship between the essential limitation of substances and the idea of an involvement of nonbeing in the explanation thereof, i.e. a constitution of substance in terms of being and non-being, which maps onto the relation between form and matter or between activity and passivity. But such a reading also gives rise to the notion of a simple substance: The basic explanatory principles, which ground the varied phenomena we perceive, are an infinite number of essentially active forces. As created forces, they are essentially limited in their activity, and this essential limitation is non-being of some kind. But non-being is not a component or part of this active force, but the signalling of an absence. Therefore, this active force is a unity in the strongest sense, it is a partless being that does not require a further explanation of its unity.

[208] Gr 364/AG 114.
[209] Discourse on Metaphysics (1686) §30 (G IV 455/AG 62).

The support for the idea that there are such simple, indivisible, active unities is provided by introspection. Our minds present themselves as such beings.

3.2. To De Volder

The correspondence Leibniz began with the Dutch Cartesian Burchard De Volder[210], which started in 1698 and lasted for about seven years, is for several reasons of great interest. First of all, we can see here Leibniz engaging with a philosopher who is appreciative of Descartes' philosophy, even if he is not one who regards himself as fully committed to all of its details.[211] And although Leibniz seems somehow reluctant to reveal his own metaphysical views throughout the correspondence, we eventually find an important and much discussed, rather complex picture of monads and their connection with 'corporeal substances' laid out in it.[212] But in another respect, the correspondence is also slightly disappointing. A great deal of it, almost all of the first two years, is spent by Leibniz with the attempt to convince De Volder of the accuracy of his measure of force as opposed to the one offered by Descartes. Possibly dishearteningly for Leibniz, it is an example supplied by Bernoulli[213] that finally convinces De Volder of its accuracy and allows them to turn towards more metaphysical issues.[214] But even then the following years are spent mainly with Leibniz urging De Volder to present his own position, despite the latter's insistence throughout the correspondence that he would be far more interested in hearing Leibniz's arguments for the necessary

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[210] For details about De Volder, see LDV, xxiv-xxv.

[211] In fact, De Volder complained not only to Leibniz himself, but also to Johann Bernoulli, who initiated the exchange of letters and facilitated major parts of the correspondence, that Leibniz seemed to think of him as being so blinded by his commitment to Cartesianism that he, De Volder, dismisses arguments without basis. (See, e.g., De Volder to Leibniz, 12 November 1699, LDV 134-45; Bernoulli to Leibniz, 7 August 1699, LDV 116-17).

[212] Leibniz to De Volder, 20 June 1703, LDV 255-69.

[213] LDV, 173-75.

[214] Another possible source of disappointment is the fact that Leibniz and De Volder hold "such radically different conceptions of the nature of extended things [that it] precludes any serious discussion of the question of whether extension is independently conceivable. Leibniz has a conception of body that precludes such a view. De Volder has one that sanctions it. Nothing that the two say in any other context brings either closer to the other's view. Nor do they say anything that approaches the issue more directly." (Paul Lodge, "The debate over extended substance in Leibniz's correspondence with De Volder," *International Studies in the Philosophy of Science*, 15.2, 2001, 160.)

activity of substance. Only about one third of the letters then contain mainly Leibniz's own metaphysical views, scattered with Anti-Cartesian arguments. But he fails to fully convince De Volder, who eventually stops replying to Leibniz's letters and thus finally closes down the correspondence.[215] The correspondence itself, like most other texts, is not directly concerned with the simplicity of substances, but it is required as background for the understanding why simplicity forms a core notion.[216]

It is relevant to keep the way the discussion evolved in mind for several reasons. Firstly, a change in terminology within the correspondence might correspond to a change in topic, even if this may not be made explicit. In the first letters, while discussing the correct measure of force and the problems of mechanical descriptions of the world in terms of extension and impenetrability, hence while discussing physical rather than metaphysical issues, and in the attempt to convince De Volder of his view, Leibniz is engaged with the objects of physics or what can be explained mechanically, which he will later in the correspondence refer to as phenomena[217], rather than being, metaphysically strictly speaking, committed to corporeal substances.[218] Leibniz himself gives the following overview of his position to Bernoulli, before engaging with De Volder directly:

> I have often said (and you seem not to disapprove) that it belongs to the nature of body that all the phenomena in bodies, even elastic force, can be explained mechanically, but that the principles of mechanism, i.e., of the laws of motion, cannot be derived from the consideration of extension and impenetrability alone. And so something else must be judged to be in bodies from whose modification conatus and impetus arise, as figures arise from the modification of extension. [219]

Since Bernoulli was familiar with and sympathetic to Leibniz's position, it might not have been required for Leibniz to be overly careful in how he phrases his thoughts. But if one assumes a certain diligence on Leibniz's part in the explication of his system, this passage is rather puzzling and interesting at the same time.

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[215] For a more detailed account of the content of the correspondence, including Lodge's view on Leibnizian aggregation and corporeal substances, see Paul Lodge's introduction to his translation of the Leibniz-De Volder Correspondence, LDV, xxvii-ci.
[216] This will be further exploited in 3.4.
[217] See, e.g., Leibniz to De Volder, Early 1703, 20 June 1703, LDV 259-61.
[218] For a contrary view, see Garber, *Leibniz. Body, Substance, Monad*, 303-350.
[219] Leibniz to Bernoulli, 1 September 1698, LDV 9.

Firstly, we find the claim that the mechanical explicability of bodily *phenomena* belongs to the nature of bodies, but at the same time that the principles of mechanism themselves are not derivable from extension and impenetrability alone. Bodies seem here to present a kind of mediating position between the phenomena and their metaphysical foundation. While they behave according to the laws of motion, their nature, or what grounds these laws, is something distinct from the properties we perceive them to have. Here we find bodies as objects of our perception and as the objects of physics. But since bodies in these senses cannot be the source of their perceived and experimentally produced behaviour, their nature must be something that gives rise to such appearances and requires the assumption of something essentially active, a metaphysical basis, on which the phenomena of physics supervene. Instead of trying to motivate the assumption of an active substance, in its nature distinct from extended objects, by referring to introspection and the experience of an 'I', Leibniz presents here a different motivation, drawing from the shared experience of extended moving objects. And he continues to illustrate this view by offering a summary of his metaphysical views, which will turn out to provide also an overview of the issues that will be further discussed in the correspondence with De Volder himself:

> By *monad* I understand a substance truly one, which, of course, is not an aggregate of substances. Matter itself, intrinsically, i.e., bulk [*moles*], which you can call primary matter, is not a substance; indeed, it is not an aggregate of substances, but something incomplete. Secondary matter, i.e., mass [*massa*], is not a substance, but substances. So not the flock but the animal, not the fish pond but the fish, is one substance. But even though the body of an animal or my organic body is, on the contrary, composed of innumerable substances, they are not parts of the animal or of me. But if there were no souls or analogous things, then there would be no I, no monads, no real unities, and so there would be no substantial multitudes. Indeed, everything in bodies would just be phantasms. Whence one can easily judge that there is no part of matter in which monads do not exist.[220]

Not surprisingly, we find in the letters to Bernoulli an explicit commitment to monads as true unities, which are to be contrasted with primary matter or 'matter itself' as something incomplete and secondary matter as a collection of substances.

[220] ibid.

But it is not immediately obvious what Leibniz is trying to tell us here about the connection between monads and animals, and neither was it to Bernoulli, who questioned Leibniz further on this account. And Leibniz delivered in his reply further definitions of the terms involved:

> [M]atter in itself, that is, primary matter, or bulk [*moles*], as separated from secondary matter. I respond it is that which is merely passive, and separated [*sejunctum*] from souls or forms. You ask, second, what is 'incomplete' for me here? I respond: it is the passive without the active, and the active without the passive.[221]

We might say, so far so good, and in accordance with what we have already seen indicated in the various metaphysical writings of the 1690s. And, equally unsurprisingly, Leibniz continues by describing portions of mass as having "as many individual substances in it as there are animals or living things or things analogous to them…"[222] But then, he continues by a somewhat surprising further definition of what a monad is:

> (4) What I call a complete monad or individual substance [*substantia singularis*] is not so much the soul as it is the animal itself, or something analogous to it, endowed with a soul or form and an organic body.
> (5) You ask how far one must proceed in order to have something that is a substance, and not [a collection of] substances. I respond that such things present themselves immediately and even without subdivision, and that every animal is such a thing. For none of us is composed of the parts of our bodies.[223]

Prima facie, this seems to suggest that a monad is a corporeal substance, i.e. a substance composed of a substantial form united with secondary matter that constitutes its organic body. But this is by no means the only possible reading. Given what we have already seen and what stands written before us, it could equally well be that this animal itself (taken analogous to the 'I'), as it is stated here, is equivalent to the monad, but does not immediately include secondary matter, since animals, and that we are, though we have an organic body, are nonetheless not 'composed of the parts of our bodies'. And, as Robert Adams points out, "[i]t

[221] Leibniz to Bernoulli (20/30 September 1698), GM III 541-42/AG 167.
[222] ibid., GM III 542/AG 167.
[223] ibid.

is natural to take that as implying that the parts of the body are not constituents of the substance. And one might think that if the parts are not constituents of the substance, neither is the whole body, which is the sum or aggregate of the parts."[224] Hence one might be entitled to think that in the preliminary letters to Bernoulli, Leibniz presented a metaphysical view that requires only simple substances as the fundamental explanatory principles.

Let us turn now from the preliminaries of the correspondence to the discussion Leibniz had with De Volder himself. A first relevant aspect of the structure of the correspondence is Leibniz's insistence that physical issues need to be resolved before he is willing to delve into metaphysical discussions. This might be partly based on his eagerness to convince De Volder of the correctness of his physical views, but it might also indicate that for Leibniz there is, in some sense, an epistemic priority, or at least importance, of phenomena or physics over substances or metaphysics in the order of discovery.[225] It is the behaviour of physical bodies that can form a starting point of investigation and lead us to metaphysics in general and to the adequate notion of substance in particular, though the reasoning that is involved in this process includes the application of principles and notions that are not gained from experience. Therefore Leibniz demands patience from De Volder and tries to persuade him that the manner in which they are proceeding, i.e. one that starts with explicating the measure of force and the nature of physics, is the one that needs to be taken:

> I have learned from our friend Mr. Bernoulli that it seems more important to you that light be shed on the activity of substance than that the force of bodies be measured. I agree, and I approve of your judgment. But nonetheless, it has always seemed to me that this is the gate through which to pass to true metaphysics. The soul is gradually freed from the false notions of the populace, and even the Cartesians, concerning matter and motion and corporeal substance, when it has come to understand that the

[224] Adams, *Leibniz. Determinist, Theist, Idealist*, 280. For thorough discussion of this passage from the letter to Bernoulli, see ibid. 277-281.

[225] See also *New Essays*, Preface, NE 50: "It would indeed be wrong to think that we can easily read these eternal laws of reason in the soul [...]; but it is enough that they can be discovered within us by dint of attention: the senses give the occasion, and the results of experiments also serve to corroborate reason". Also the other way Leibniz proposes, namely the one from introspection, seems to be based on experience rather than reason. It is the experience of ourselves that tells us that we are indivisible, active unities. Only once this insight has been gained, reason tells us how far this extends to other substances and the consequences that follow from it.

> rules of force and action cannot be derived from these notions...[226]

Even though Leibniz regards it as essential to agree on basic issues in physics, his insistence on not moving on seems, at least in part, to be based on the further desire to convince De Volder of his measure of force, and not merely as a prerequisite for entering into metaphysics. Leibniz admits to Bernoulli, in one of the letters that precede the actual correspondence with De Volder himself, that any conservation of force, independently of how it is measured, requires that there is something in body beyond extension and impenetrability.[227] And on this point, there is no need to convince De Volder, since he already assumes the Cartesian principle of the conservation of motion and pleads that if only Leibniz could give "an a priori demonstration that every substance is active, I might easily persuade myself that from this most fruitful source of truth follows […] the resolution of my worries [i.e. what the source of motion is]". What seems, therefore, more important than the correct measure of force in the first part of the discussion are the reasons Leibniz gives for the insufficiency of matter as conceived of by the Cartesians.

One of his main criticisms is, as we have already seen, aimed at the use of the notion of 'extension' itself. In difference to Descartes[228], Leibniz argues now explicitly that it is not a primitive notion, but rather

> that it is a resolvable and relative notion. For it is resolved into plurality, continuity, and coexistence, i.e., the existence of parts at one and the same time. [...] But from this it appears that something must always be assumed that is continued or diffused, such as whiteness is in milk […] and resistance is in matter. For, in itself, continuity (for extension is nothing but simultaneous continuity) no more completes a substance than multitude or number, where there must be something numbered, repeated, and continued. And so I believe that our thinking is completed and terminated more in the notion of dynamism than in that of extension, and no other notion of power or force should be sought than that it is an attribute from which change follows whose subject is substance itself.[229]

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[226] Leibniz to De Volder, 1 September 1699, LDV 131.
[227] Leibniz to Bernoulli, 29 July 1698, LDV 5-7.
[228] See Descartes, Rules for the Direction of the Mind, Rules 12, in Rene Descartes, *The Philosophical Writings of Descartes. Volume 1*, trans. John Cottingham et al. (Cambridge: Cambridge University Press, 1985), 44 and his letter to Princess Elizabeth, 21 May 1643, in *The Philosophical Writings of Descartes. Volume 3*, trans. John Cottingham et al. (Cambridge: Cambridge University Press, 1991), 218.
[229] Leibniz to De Volder, 3 April 1699, LDV 73.

As a relative notion, extension must be, for Leibniz, grounded in some other property, a property that is non-relative, but this also requires that there are some things that are unextended, which are the bearers of this property. It is essential that they are unextended, because otherwise we would need to ask again what their extension, as a relative property, is grounded in, and we would not be any closer to an explanation of 'extension'. Leibniz seems to have no difficulty in identifying what this property is that grounds extension, i.e. what the property is that both (or all involved) *relata* that stand in the relation of extension to each other must possess. Extension as a 'simultaneous continuity' requires something that is continued, and this is a 'dynamism', the 'notion of power or force … from which change follows whose subject is substance itself'. But there is, therefore, so Leibniz claims, a difference between Descartes' opinion that matter is indifferent to being in this or that state and his own view that there is a resistance or opposition in matter to changing its state, i.e. an inclination to remain in the state it is already in. "[S]ince matter intrinsically resists motion by means of a general passive force of resistance, but is put into motion by a special force of action, i.e., an entelechy, it follows that, even with enduring motion, inertia constantly resists the entelechy, i.e., the motive force"[230]. This active principle or entelechy is indispensible, since changeable active forces and motions, as changeable and hence temporary, need to be modifications of some persisting substantial thing, i.e. they are accidents that need to inhere in a substance. But as they are, nonetheless, forces and actions, they cannot be modifications of a passive thing such as matter. "It follows, therefore, that there is a primary active, i.e., substantial, thing, which is modified by the added disposition of matter, i.e., that which is passive. Hence secondary, i.e., motive, forces and motions themselves should be attributed to secondary matter, i.e., to the complete body itself that results from the active and the passive."[231] It should be noted that this disposition of matter added to the substantial thing is what gives rise to the perceived derivative forces of the body, which thus seem to stand in some kind of supervenience relation to the active substantial thing with its passive disposition. And this active principle is related to extension in a similar way, since it

[230] ibid. LDV 75.
[231] ibid. LDV 77. Note that the complete body itself as secondary matter is not composed of the active and the passive, but rather *results from* it.

is "something prior to extension and constitutive of the very substance that is in that which is extended."[232] Extension as such, on the other hand, is therefore "nothing but an attribute of an aggregate resulting from many substances"[233]. In later letters Leibniz frequently has the opportunity to return to the notion of extension and describes it as "bring[ing] nothing to mind except a certain diffusion (i.e., a continuous repetition) of some common nature throughout a plurality of coexisting things. Moreover, it does not describe what in the world this nature might be but presupposes it."[234]

Several things in this passage are noteworthy. Firstly, the phrasing is strongly reminiscent of what we have already heard about the mind-dependence of aggregates: It is the mind that picks up a certain common element, a common nature, in a plurality of things, and subsumes those things under the notion of an extended whole. We find, secondly, that extension does not tell us directly anything about the nature that grounds it. The passages we have seen before were mostly phrased in terms of there being something required over and above mere extension or in addition to extension rather than prior to extension. But from this, thirdly and more interestingly, the question concerning the characteristics of this diffused nature arises. This nature that is a prerequisite for extension and has so far been described as a 'primary active' and 'substantial' thing and which is said to be diffused, is now termed a "dynamism, from which there is action and passion"[235] or, put differently, "this nature that is supposed to be diffused, repeated, or continued is that which constitutes physical body, and it can be found in nothing other than the principle of acting and being acted upon, since nothing else is suggested to us by the phenomena."[236] But that whose nature is diffused, the active and passive principle, even though it constitutes the nature of extension, cannot itself be extended. We have seen that extension as a relation requires a foundation in properties that themselves are non-relational. But if extension is a relative and resolvable notion, the properties it can be resolved into do not involve themselves

[232] Leibniz to De Volder, 6 July 1699, LDV 102.
[233] ibid.
[234] Leibniz to Bernoulli, 27 December 1701, LDV 227.
[235] Leibniz to De Volder, April 1702, LDV 240-41; for a discussion of dynamism in the correspondence with De Volder, see Lodge's introduction to this text at LDV lxxix and xc.
[236] Leibniz to De Volder, 30 June 1704, LDV 305.

extension. Leibniz's reasoning here suggests that the fact that we perceive extended objects, in combination with the claim that extension is a merely relative notion, requires the assumption of partless, simple substances. This is a slightly different reasoning than the one that proceeded from worries about the unity of extended objects. It is not the problem about unifying something that is composed of an infinite number of parts, but the fact that the composition of extended parts is merely a relative, perceptual quality of the thing, which demands grounding. It is not essential, in this line of reasoning, that the grounding substance is a unity, but that it is unextended and partless. But due to being unextended and partless, it will also be essentially a unity.

Furthermore, this extended thing, whose extension is based on the diffusion of some active and passive natures, even though I might refer to it as 'my body', is something my soul has, so Leibniz's claim, no immediate control over. To clarify this point, a further distinction is put in place, concerning the notion of body:

> When I say that the soul or entelechy has no power over the body, I understand by body, not the corporeal substance whose entelechy it is, which is one substance, but the aggregate of other corporeal substances constituting our organs. For one substance cannot influence another, let alone an aggregate of others. What I mean is this: Whatever happens in a mass or in an aggregate of substances in accordance with the laws of mechanics is expressed in the soul or entelechy [or, if you prefer, in the monad itself, i.e., the one simple substance consisting of both activity and passivity] through its own laws. But the force of change in any substance is from itself or from its entelechy. [… S]ince there are so many individual entelechies in the mass of our body, it obviously follows that not everything that happens in our body is to be derived from our entelechy, even if it agrees with it. Without a doubt, entelechy, i.e., force, i.e., activity, differs from resistance, i.e., passivity. You could take the former for form and the latter for primary matter. However, they do not differ in such a way that they should be regarded as two distinct substances, but as constituting one. And the force changing the primary matter is certainly not a force that is proper to it but is the entelechy itself.[237]

We see here a clear distinction between corporeal substance on the one hand and the body as an aggregate of corporeal substances on the other. While the former seems to be intimately connected to the notion of monad, the aggregate of

[237] Leibniz to De Volder, 20 January 1700, LDV 155-57.

corporeal substances is not. As an aggregate, it is rather constituted by an infinite number of corporeal substances other than the corporeal substance that is connected with the entelechy, and since there is no interaction between substances, there cannot be one between the soul and a collection or aggregate of substances distinct from it.

But none of this answers De Volder's primary question, namely how Leibniz can show that substances are *intrinsically* active. In a remark on a letter by Bernoulli from 10 February 1700, Leibniz notes: "I define substance as that which acts or is acted upon. Whatever can be acted upon can necessarily act as well. Whatever acts is intrinsically active."[238] It is clear that De Volder, had he seen this definition, would not have impressed by it, since as an answer to his question this seems to be insufficient at best. But even though it is only a short comment, it allows some insight into Leibniz's idea of how activity and passivity are connected in a substance. It is not that the two just come together, but that they depend on each other.[239] But given Leibniz's view that substances do not stand in any kind of causal interaction with other substances, this mutual dependence of action and passion is purely intrasubstantial. Hence Leibniz's definition as given here applies presumably only to created substances, since God is not and cannot being acted upon. But it is a definition that is also aimed at convincing Cartesians that the assumption of a concrete, purely passive matter is inconsistent. Bernoulli wonders what this matter might be that souls act on and Leibniz notes in response on his copy of that letter that "[i]t is a passive power, which corresponds to our souls as active. It is not an extended thing (primary matter, I mean)".

Leibniz does not send this definition of substance to De Volder, but instead sends him a rather sketchy hint at how the necessary activity of substances might be derived, namely from the incommunicability between substances joined with the experience that substances nonetheless act.[240] But as a first step Leibniz demands that they agree on a definition of substance, indeed an important prerequisite in

[238] To Bernoulli, he sent a slightly expanded version of this thought: "If, like all the scholastics, we mean by substance that which can act or be acted upon, and, moreover, nothing is acted upon unless it also acts, it follows that every substance can act. For, if it is already established that every substance that can act is intrinsically active, it follows that every substance is like this." (Leibniz to Bernoulli, 8 March 1700, LDV 163.)
[239] We have seen a similar reasoning being employed already in the 'Disputatio' of 1663.
[240] Leibniz to De Volder, 6 September 1700, LDV 181.

undertaking any a priori proof, in order to then show how activity follows from the nature of substance.[241] Even though Leibniz is not satisfied with the definition proposed by De Volder and highlights its shortcomings, the discussion gives him also occasion to offer glimpses of his own notion of substance. In a marginal note, probably not sent to De Volder, Leibniz states that "[a] substance is a complete atom, an intrinsically complete atom, i.e., an atom completing itself. From this it follows that it is a vital atom, i.e., an atom having an entelechy. The same atom is that which is truly one."[242] The notion of unity Leibniz proposes here and elsewhere in the correspondence seems to be stronger than might be assumed at first sight. He contrasts De Volder's Spinozistic proposal[243] that there might be in fact only one extended substance which has individual bodies as its modes (rather than there being a plurality of extended substances) with his own notion of a simple substance as that which lacks parts. He concedes that

> if all the things that have a necessary connection with one another were one substance, it would follow – at least on the assumption that the vacuum was excluded – that all the parts of matter would compose one substance, because they have a necessary connection. But through this very [reasoning], a substance would be confused with an aggregate of substances.[244]

The phrasing of this passage indicates that while Leibniz agrees with the assumption that there is no vacuum[245], he disagrees with the claim that 'all things that have a necessary connection with each other are one substance'. Hence it seems that necessary connection does not make unity and, due to the fact that unity is a characteristic of substance, necessary connection does not make substantiality. Therefore, bodies, even if their corporeal parts were to stand in any necessary connection to each other, would not constitute a substance. We see indicated here

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[241] In fact, Leibniz pushes De Volder to present his own definition of substance, which is followed by a discussion about the adequacy of the notion he proposed. For a detailed analysis of this discussion and its general implications for the whole correspondence, see Lodge, "Leibniz's Notion of an Aggregate" and LDV, li-lx. It should also be kept in mind that an a priori proof in pre-Kantian times is a proof that proceeds from cause to effect and gives insight into why the effect obtains (cf. LDV, xlvi). How Leibniz thought such a proof, that would need to be based on the experience that substances act, would proceed, I do not know.
[242] Leibniz to De Volder, 6 July 1701, LDV 205.
[243] For details see Lodge's Introduction to the correspondence at LDV li-liii.
[244] Leibniz to De Volder, April 1702, LDV 239.
[245] See, e.g. Leibniz to Bernoulli, 17 December 1698, AG 169-170.

that, for Leibniz, there is a general problem and that wholes, i.e. things that have parts, may never, strictly speaking, qualify as substances, but also that his notion of unity is extraordinarily strong: even necessary connection between two things does not suffice to make them one substance. One might be tempted to think that only something that is simple, and therefore not requiring even a necessary connection between components, can therefore be a substance. But these remarks are prompted by De Volder's definition of substance and in this strength, as far as I can tell, not found elsewhere in Leibniz.

But the most thorough exposition of his notion of substance in the whole correspondence is found in a letter to De Volder, written on 20 June 1703. Here Leibniz starts by arguing, among other things, for a necessary correspondence between matter and resistance, whose cause "is the fact that every substance is active and every finite substance is passive, and passivity is connected to resistance. Therefore, the nature of things demands such a conjunction. It cannot be so impoverished that it lacks a principle of action, and it no more allows a vacuum in forms than in matter."[246] In difference to the definition of substance that Leibniz gave earlier to Bernoulli, he presents here a general definition of the nature of substance (activity) and a further limitation on this notion for finite substances (passivity). But the use of the term 'matter' is not immediately clear, hence Leibniz further explains:

> Properly and rigorously speaking, perhaps one will not say that the primitive entelechy impels the mass of its body, but only that it is joined with a primitive passive power that it completes, i.e., with which it constitutes a monad. However, it cannot influence other entelechies and substances, even those existing in the same mass. But in the phenomena, i.e., in the resulting aggregate, everything is indeed explained mechanically, and masses are understood to impel each other. And in these phenomena, nothing is needed except the consideration of derivative forces, once it is agreed where they result from, namely, the phenomena of aggregates from the reality of monads.[247]

We have here a distinction between monads on the one hand, which are constituted of primitive powers, and the aggregates of them, which we then in

[246] Leibniz to De Volder, 20 June 1703, LDV 257.
[247] ibid., LDV 261.

some way perceive, i.e., the phenomena, on the other. While there is no interaction between monads, the phenomena can be explained mechanically, as if there was interaction between bodies. And even though there is no causal interaction, there is nonetheless some kind of connection between the soul and the body, namely one of expression. But we also get, now more explicitly then before, an indication of several metaphysical layers and the relation between substances and phenomena, and between primitive and derivative forces: "I regard the substance itself, endowed with primitive active and passive power, like the *I* or something similar, as the indivisible, i.e., perfect, monad, not those derivative forces that are continually found to be one way and then another."[248] The derivative forces arise from mass and belong to aggregates, i.e. to the phenomenal realm. But there is nonetheless a connection between them and the primitive forces that are found in the substances themselves, insofar as derivative forces are "modifications and echoes of primitive forces"[249]. Bodies cannot be solely constituted of derivative forces joined with resistance, because every modification presupposes something lasting, something it is a modification of, and, therefore, bodies or the properties we perceive them to have presuppose substances.[250]

But there is also a similarity between substances and phenomena: There is not only no interaction between monads, but the same holds for phenomena and derivative forces. It is not the case that some mass supplies another given mass with new force by impact, but its existence is the reason for the change in the determination of the force that is already existing in this given mass. Hence it seems as if, though there are collision and impulse to be found in the appearance of aggregates or phenomena, it is not the derivative force itself that is transmitted from one body to another. The grounding substances transfer their causal independence onto the aggregates that result from them.

Following all these arguments, the expanded view on the nature of monads and corporeal substances that follows is not surprising, but nonetheless worth

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[248] ibid., LDV 263.
[249] ibid., LDV 263.
[250] For a thorough discussion of the notion of derivative forces as momentary, see Donald Rutherford, "Leibniz on Infinitesimals and the Reality of Force," in *Infinitesimal Differences: Controversies between Leibniz and his Contemporaries*, ed. Ursula Goldenbaum and Douglas Jesseph (Berlin: De Gruyter, 2008).

quoting in full:[251]

> If you take a mass to be an aggregate containing many substances, you can nonetheless conceive of one substance that is preeminent in it, if indeed that mass constitutes an organic body animated by its primary entelechy. For the rest, in the monad, i.e., the complete simple substance, I do not unite anything with the entelechy except a primitive passive force related to the whole mass of the organic body. Indeed, the remaining subordinate monads placed in the organs do not make up a part of the organic body, although they are immediately required for it, and they come together with the primary monad for the organic corporeal substance, i.e., the animal or plant. I therefore distinguish: (1) the primitive entelechy, i.e., the soul; (2) matter, namely, primary matter, i.e., primitive passive power; (3) the monad completed by these two things [*Monada his duabas completam*]; (4) the mass, i.e., the secondary matter, i.e., the organic machine, for which innumerable subordinate monads come together; and (5) the animal, i.e., the corporeal substance, which the monad dominating in the machine makes one.[252]

This passage *prima facie* suggests a composition of a monad out of a formal and a material aspect and a view that incorporates corporeal substances as composed of a monad and its organic body. But on the reading proposed here we are not forced to regard the individual steps from (1) to (5) as different things, but distinctions the mind can make when looking at a substance. As (2) primary matter is in itself incomplete and not really distinct from (1) the entelechy, the former does not add anything positive to the latter when one looks at (3) the complete monad. (Therefore Leibniz will say in the same letter that there "is almost nothing in body [and we might add: in its foundation, the substance] but entelechy"[253].) In a certain way, the ontological basic unity, a simple substance, is constituted by two explanatory principles, and this simple substance and its constitution is regarded as being sufficient in order to account for or ground all the phenomena we perceive. And as (4) secondary matter is derived from the primitive powers of the monads

[251] This passage has served for a significant number of interpreters with a wide range of different views as a touchstone or support for their proposed reconstructions. See, for example, Adams, *Leibniz. Determinist, Theist, Idealist*, 269-72, and Phemister's discussion of this passage as well as Adams' interpretation of it in her *Leibniz and the Natural World*, 33-40; Look and Rutherford's introduction sets in this passage in relation to the conception of substance in the correspondence with Des Bosses (LDB li-lvii); and Lodge's introduction to the De Volder correspondence gives an thorough analysis of varies concepts involved in this passage, but also puts it into relation to the concept of a dynamism (LDV lxxvi-xc).
[252] Leibniz to De Volder, 20 June 1703, LDV 265.
[253] Leibniz to Bernoulli, 20 June 1703, LDV 269.

aggregated in it, and is, moreover, a phenomenon, it does not seem to constitute a substantial part either. As a phenomenon, it is, however, grounded in the reality of monads that form the basis of its properties and in this way it is different from a mere illusion.

But the beginning of this passage might still make us feel a bit uneasy about this interpretation, since it seems to suggest a different view. But when compared with an earlier draft of the letter, a different picture emerges. Here, the first passage is phrased in the following way:

> If you take a mass to be an aggregate containing many substances, it will by no means be one thing with the preeminent monad of the primary mass, for one entelechy together with others does not constitute a monad. And so in one monad, i.e., a complete simple substance, I do not conjoin anything with the entelechy except a primitive passive force expressing the whole mass, for which the remaining subordinate monads placed in the organs are nonetheless immediately required.[254]

Here, it seems to be suggested that, even though there might be found a dominant monad, the mass of its organic body will nonetheless not form a unity. There is connection between the dominant monad and its body, but it is not one that results in a unified corporeal substance that is composed of smaller corporeal substances.

But there is a further essential part that the simple substances, despite – or rather: due to – their role as persisting beings, must play. They must change internally in order for there to be any change in things at all. Since they cannot interact with other simple substances and, therefore, cannot be causally influenced by them, change can only come from within themselves. But in the phenomena or aggregates, change can be ascribed to collision in accordance with laws described partly by metaphysics and partly by geometry, as Leibniz explains, "[f]or one needs abstraction in order to explain things scientifically."[255] Hence, in a mass, the parts are regarded as incomplete things that contribute something to the whole mass, which, in return, can be regarded as being completed by the coming together of its parts. But the substance itself is complete by itself and involves everything: "For there is as much difference between a substance and a mass as there is between

[254] Earlier draft of Leibniz to De Volder, 20 June 1703, LDV 265.
[255] Leibniz to De Volder, 20 June 1703, LDV 267.

complete things, as they are intrinsically, and incomplete things, as they are comprehended by us through abstraction."[256]

The relation of expression between monad and its body is supplied with a further aspect, which enriches or expands on the notion of harmony among things. Any body expresses all other bodies in the universe and any soul or entelechy expresses its own body and through it everything else. This situatedness of monads is essential to their having a point of view, but it is, at the same time, puzzling. How are monads situated in extension, though they are unextended? Leibniz, aware of this difficulty, attempts to solve the problem by the following explanation:

> For even if monads are not extended, they nonetheless have a certain kind of situation in extension, i.e., they have a certain ordered relation of coexistence to other things, namely, through the machine over which they preside. I do not think that there exist any finite substances that are separated from every body and therefore lack situation or order in relation to the other coexisting things in the universe. Extended things involve intrinsically many things endowed with situation. But things that are simple, even if they do not have extension, must nonetheless have a situation in extension, although it may not be possible to designate it precisely, as with incomplete phenomena.[257]

We see that extension is intimately connected with the notion of substance. But there is a qualitative difference between extended things such as bodies and simple things. After metaphysical analysis, a priority of the active unity over all other aspects becomes visible: "Since there is almost nothing in body but entelechy, I do not see how it could be deprived of it. Certainly there cannot be a substance without an entelechy. When I say that at creation force was impressed on body, I mean nothing other than that it had no existence before it had force. I add that it could not have had any existence before it had force."[258]

De Volder further questions Leibniz on these issues and correctly points out that Leibniz's theory seems to suggest that a substance does not resist another, strictly speaking, but only its own active force. And Leibniz agrees that this is indeed the case:

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[256] ibid., LDV 267.
[257] ibid., LDV 267-69.
[258] Leibniz to Bernoulli, 20 June 1703, LDV 269.

> You think that the resistance in a substance can bring about nothing other than the fact that the substance opposes its own active power. But this should not seem absurd to you, since it is also the case in quasi-substances, i.e., bodies, that the bulk restricts the speed that another tries to impress. Certainly there must be a principle of limitation in limited things, just as there must be a principle of action in acting things.[259]

Here, a further aspect of created simple substances is indicated. As we have seen above, Leibniz has already expressed his opinion that finite substances are necessarily to a certain extent passive, and he now connects in a similar vein the limitation of these substances with their resistance or their passive aspect. And here again, we find that limitation works on the metaphysical as well as the phenomenal level and that what we perceive on the phenomenal level is the starting point for our considerations of the constitution on the metaphysical level. Leibniz claims "that derivative, i.e., accidental, forces are mere modifications, and that that which is active cannot be a modification of that which is passive, since in modification there is only a variation of limits. And so modes only limit things and do not increase them, and therefore they cannot contain an absolute perfection that is not in the thing to be modified."[260] The argument Leibniz seems to have in mind is that if modes require subjects in which they adhere and if they, furthermore, only limit, but do not increase their subjects, then derivative forces require primitive forces. "[D]erivative force is the present state itself insofar as it tends toward a following state, i.e., preinvolves a following state"[261] and stands in contrast to the persisting thing, which is the primitive force which is to be limited and which involves all states. Hence "primitive force is like the law of a series, and derivative force is like a determination that designates some term in the series"[262]. The fact that Leibniz suggests here that only derivative force requires a substance it inheres in, but primary force does not, opens another interesting problem about the constitution of his simple substances, which is connected to the question of what it means not to have parts. This problem is furthered by the fact that he points out to De Volder that there is nothing permanent in these real unities apart from the law itself and

[259] Leibniz to De Volder, 19 November 1703, LDV 277.
[260] ibid.
[261] Leibniz to De Volder, 21 January 1704, LDV 287.
[262] ibid.

that the law is distinct from the individual states (which are derivative). Hence it must be the case that what constitutes a substance is not the sum of its states[263], and as John Whipple points out, this is important, since otherwise a substance would run the risk of being nothing other than an aggregate of distinct perceptual states, but not a metaphysical point.[264] That force is not something substantial, but something inhering in a substance, is correct for changeable, i.e. derivative, force; but force as the principle of action and passion, i.e. as primitive force, is what persists and grounds the notion of extension[265] as well as derivative forces. Here the underlying primitive force is not merely an active force, but at the same time it is set in analogy with the 'law of a series'. Individual substances are "intrinsically active, 'spiritual automatons', which spontaneously change from one state to another by [their] inherent dynamism"[266]. It seems that it is not this or that state that constitutes the nature of a substance, but the law of development from which all those states are derived.

We have already seen that extension, for Leibniz, is a relative notion that is resolvable into others, and we have seen that this fact serves as argument for simple substances. But in the De Volder correspondence, Leibniz introduces also a further argument, which we have already seen indicated in writings of the early 1690s (and indeed even earlier) and which will later reappear in shorter form in the second paragraph of the *Monadology*, namely an argument based on the notion of 'aggregate'. Leibniz holds that monads or true substances are perfect unities, from which all other things result. Hence a substance cannot be an aggregate (and vice versa), since a substance has genuine unity while an aggregate has its unity from an aggregating mind. He already indicated in his letter from 20 June 1703 that any being through aggregation, such as a flock or an army, is only an 'apparent being'. He expands on this thought in a later letter (from 21 January 1704) by presenting an argument that should lead from considerations about the nature of aggregates to the existence of simple substances:

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263 The view that a substance is the sum of its states is proposed, for example, by Benson Mates, *The Philosophy of Leibniz*, 50.
264 John Whipple, "The Structure of Leibnizian Simple Substances," *British Journal for the History of Philosophy* 18.3 (2010): 387.
265 Leibniz to De Volder, 30 June 1704, LDV 305.
266 Richard Arthur, *Leibniz* (Cambridge: Polity Press), 161

> *First*, that which can be divided into many is constituted, i.e., aggregated, from many. *Second*, things that are aggregated from many are not one thing except from a mind, and they have no reality except that which is borrowed, i.e., that is from the things from which they are aggregated. Therefore, *third*, things that can be divided into parts have no reality unless there are things in them that cannot be divided into parts. Indeed, they have no reality other than that which is from the unities that are in them.[267]

If one considers Leibniz commitment to the convertibility of unity and being, the argument seems to suggest that "for bodies to be real, their existence must be explained in terms of principles of reality, which are necessarily principles of unity"[268]. The guiding thought is, then, that if material or aggregated things are real, their existence must be explained by the prior reality of substances of some kind, either by asserting that at least some bodies are genuine unities or by positing incorporeal unities in matter. But we have already seen that these fundamental unities, in order to ground extended things – which are also aggregates things – must be simple unextended substances or unities.

But there is further reason to ascribe to simple substances the function of grounding aggregates. For Leibniz, in concrete things, i.e. bodies, as opposed to merely ideal things, parts are actually assigned in a certain and determinate way according to the divisions nature imposes on bodies by different motions; they are in fact aggregates and dependent on the parts they are aggregated from. The division of parts proceeds to infinity, therefore its extended parts can never ground the reality of the extended whole. But these parts nonetheless ultimately *result from* an infinite number of real unities.[269] There is an ambiguity here that Leibniz seems well aware of. It is not the division of extended parts, i.e. parts of bodies, that finally terminates in substantial unities. No matter how far this division proceeds, the result will always be smaller, but still extended parts. Hence, when Leibniz relates bodies to monads, it is not a relation of a whole to its smallest or ultimate parts, as an atomist, for example, would have it. It is rather the case that

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[267] Leibniz to De Volder, 21 January 1704, LDV 285-87.
[268] Donald Rutherford, "Unity, Reality and Simple Substance: A Reply to Samuel Levey," *The Leibniz Review* 18 (2008): 212.
[269] Leibniz to De Volder, 30 June 1704, LDV 301-03.

> accurately speaking, matter is not composed of constitutive unities; rather it results from them, since matter, i.e., extended mass, is nothing but a phenomenon founded in things, like the rainbow or the perihelion. And there is no reality in anything except the reality of unities, and so phenomena can always be divided into lesser phenomena that could appear to other more subtle animals, and the smallest phenomena will never be reached. By contrast, substantial unities are not parts, but the foundations of phenomena.[270]

In real concrete things, the unities are prior to the multitude; multitudes exist only through unities. Matter as extended mass, on the other hand, is not continuous, but discrete and actually divided to infinity,[271] but therefore also a phenomenon. The existence of extended masses requires, in the last analysis, the existence of simple substances.

While Leibniz attempts for the majority of the correspondence to motivate his claims for the existence of essentially active unities and simple substances by referring to the phenomena we perceive, he turns towards the end of the correspondence to the argument from introspection. Under the assumption that the nature of things is to a certain extent uniform, the natures of various simple substances cannot differ to such a degree that they would constitute different kinds (a thought that is also supported by the idea of a continuous hierarchy of substances). Therefore, the nature we are best acquainted with, i.e. our own, can serve as a paradigm for substance in general (and indeed has to do so, since we have no immediate knowledge of any other substance). Hence there is something analogous to perception and appetite in the principle of action in all other simple substances. "Moreover, matter and motion are not so much substances or things as the phenomena of perceivers, the reality of which is located in the harmony of perceivers with themselves (at different times) and with other perceivers." This analogy gives Leibniz the means to connect the arguments from the physical phenomena with the better-known notion of a monad as a mind-like being. Secondary matter as a derivative force is based on the primitive forces of the individual monads that come together in the mass or extended matter, and the appearance of this derivative force is due to the fact that all these monads have

[270] ibid. 303.
[271] Leibniz to De Volder, 11 October 1705, LDV 325-27.

expressive capacities. Body is, therefore, reducible or resolvable, since "a corporeal mass that is believed to have something besides simple substances is not a substance but a phenomenon resulting from simple substances, which alone have unity and absolute reality."[272] Accordingly, derivative forces, as the forces of corporeal substances, fall into the realm of phenomena as well.

And Leibniz neatly wraps up the system he has finally arrived at:

> There is an active force and a passive force in every perceiver; the active in the transition to the more perfect, the passive in the opposite. And there is an infinity of perceivers. Indeed, there are as many as there are simple substances, i.e., monads. The order of these among themselves, expressed by our phenomena, constitutes the notions of time and space. That which results from the passions of the perceivers and limits the phenomena themselves, taken as a whole, gives rise to the apparition of bulk, i.e., of the passive force of bodies.[273]

What started of in the correspondence as a reasoning from the behaviour of physical objects and their necessary ground in the form of unextended, partless, simple unities is finally connected with our experience of ourselves as active minds.

3.3. To Des Bosses

Leibniz's correspondence with Jesuit Bartholomew Des Bosses is another of his epistolary exchanges of great interest, not only due to its abundance, but also for a seemingly peculiar feature or twist in Leibnizian metaphysics, namely, the introduction of a 'substantial bond' in order to account for corporeal substances.[274] This is especially surprising since there seems to be little to no evidence of such

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[272] Leibniz to De Volder, January 1705(?), LDV 319.
[273] Leibniz to De Volder, 19 January 1706, Supplement 2, LDV 227-37.
[274] There are various ways of viewing the ontological status and Leibniz's commitment to the 'substantial bond' of the correspondence with Des Bosses. For a thorough discussion of this topic, see especially Brandon Look, *Leibniz and the 'Vinculum Substantiale'* (Stuttgart: Franz Steiner Verlag, 1999) [= Studia Leibnitiana Sonderhefte 30.], or for a focus on its substantiality, his "Leibniz and the Substance of the Vinculum Substantiale," *Journal of the History of Philosophy* 38.2 (2000). Russell even completely reduces the substantial bond to "rather the concession of a diplomatist than the creed of a philosopher" (Bertrand Russell, *A Critical Exposition of the Philosophy of Leibniz*, London: Allen and Unwin, 1937, 152). For a more favourable view, see Adams, *Leibniz. Determinist, Theist, Idealist*, 299-303.

thoughts in some classical writings produced by Leibniz around the same time, such as the *Monadology* and the *Principles of Nature and Grace*. But there seem to be two driving considerations for this new approach or amendment of his basic simple substance ontology, which are already indicated in the plan proposed by Des Bosses right at the start of the correspondence, namely, "that with your notions preserved so far as possible, I may accommodate the substance of them with the doctrines of Aristotle, or rather, accommodate the former with the latter and both with the dogmas of the Church."[275]

Any reconciliation with the doctrines of Aristotle seems to require the admission of corporeal substances as an obvious step to take, since humans, trees and animals are the paradigmatic substances in the metaphysics of the Stagirite. But also, at least from a Roman Catholic point of view, more than monads are required in order to account for certain commitments imposed by faith, especially in order to account for transubstantiation. It hence seems possible that it is the plan of reconciliation rather than reconsidering his basic philosophical doctrines that motivates Leibniz to introduce this substantial bond in addition to monads.

But this correspondence is of additional interest, because Des Bosses questions Leibniz on some of his basic assumptions, such that he himself gets a clearer picture of the Leibnizian system, but – in difference to De Volder – not from a position of doubt, but as somebody who already embraces, or is at least highly sympathetic to, the monadological metaphysics. Therefore, less time is spent with arguing about what the notion of substance amounts to, but the focus lies on the details of the account.

As we have already seen happening before, Leibniz's favourite way of spelling out what substances and their effects are is again in terms of powers and forces. But we get a clearer picture of the relation between souls and extended bodies, now more frequently spelled out within the framework of the pre-established harmony:

> When I say that the soul makes nothing happen in matter, I mean only that the material laws of motion are not changed by the soul. In general, the soul is an entelechy or primitive active power in a corporeal substance,

[275] Des Bosses to Leibniz, 25 January 1706, LDB 7.

> through which the matter or primitive passive power of the same substance is completed; and by means of the modification of these primitive powers, actions and passions are produced in the corporeal substance itself.[276]

One of the questions that forces itself on philosophically minded people since Descartes is the question of how any interaction or other influence between mind and body can be accounted for. And Leibniz is very clear on this point: The soul does not exercise any influence on matter, at least the matter that is subject to the laws of motion, i.e., the matter that forms an integral part of the objects of physics. This is not only demanded by the system of pre-established harmony and the assumption that substances are causally independent, but it also gives an explanatory basis why bodies do behave in accordance with the laws of motion and cannot be 'sidetracked' by the mind-like forms that are connected with them. But, Leibniz claims here, the soul, together with its passive counterpart, completes a 'corporeal substance'. In the definition here, even though the elements introduced are those we have already seen in the correspondence with De Volder, i.e. primitive active and passive power, what arises from their combination is termed a 'corporeal substance' rather than a 'monad'. This might be seen as a first, crude attempt to accommodate Aristotelian intuitions in his system or just as sheer carelessness. But we have already seen a similar use of 'corporeal substance' indicated in the correspondence with Arnauld and with De Volder, hence it might be worth reconsidering the understanding of 'corporeal substance' not as a substance endowed with an organic body, but rather as a substance that is constituted by form and matter (and might enter into the composition of an organic body alongside an infinite number of other corporeal substances of this kind). In any case, this short description seems opposed to monadological writings, not only because the product of the combination of primitive forces is a corporeal substance, but also because the derivative forces, hence secondary matter, are ascribed directly to this substance as well, rather than being viewed as a result of it.

But Leibniz returns quickly to more a familiar way of putting his views and keeping an eye on the distinction between primitive and derivative forces. While

[276] Leibniz to Des Bosses, 14 February 1706, LDB 23.

things will change significantly once the substantial bond is introduced, at the beginning of the correspondence (and indeed throughout major parts of it), we find a new uneasiness concerning the status of secondary matter: "Matter (that is, secondary matter), or a part of matter, exists in the same manner as a herd or a house, that is, as a being by aggregation.[277]" A similar reasoning was already present in the letters to De Volder, but it does by now more explicitly incorporate secondary matter as an aggregated being. While secondary matter is dependent on monads to constitute it, it is not dependent on this or that particular monad. No dominating entelechy is fixed to a specific part of secondary matter, and therefore it is possible, as experience also shows us, that certain parts of matter are substituted for others while the composite thing constituted by those parts endures.[278] But things are different with relation to primary matter:

> It is otherwise if you mean primary matter or primary passive power [*to dynamikon*], primary substratum [*proton hypokeimenon*], that is, primitive passive power or the principle of resistance, which consists not in extension but in a prerequisite of extension, and completes the entelechy or primitive active power, with the result that it produces a complete substance or monad, in which modifications are contained virtually. We understand such matter, that is, the principle of passion, to endure and to adhere to its entelechy; and in this way from many monads there results secondary matter, together with derivative forces, actions, and passions, which are only beings through aggregation, and thus semi-mental things, like the rainbow and other well-founded phenomena.[279]

Here we seem to have the classical De Volder picture of monadic constitution in front of us, even though with a minor addition. The monad is not only completed by primitive active and passive powers, but the modifications of these principles are contained in it only 'virtually' and they are the basis for secondary matter in cases where a multitude of monads, or their passive principles, not only comes together but is, in addition, perceived by a mind. While this primary matter is inseparable from its entelechy, there is no need to assign even an infinitely small

[277] Leibniz to Des Bosses, 11 March 1706, LDB 31.
[278] Here Leibniz operates with a notion of unity, according to which the parts of secondary matter lack unity, because they are independent of each other (though not independent of the unities grounding them) and separable from each other.
[279] Leibniz to Des Bosses, 11 March 1706, LDB 35.

portion of extended matter, i.e., a certain quantity of secondary matter, to any entelechy in the way Des Bosses suggests Leibniz would be required to do. This addition entails a clearer picture of the nature of extension. While towards the semi-Cartesian De Volder, Leibniz merely indicated the relational character of extension, he is now openly claiming that the relata, whose connections give rise to extension, are reducible to something within the simple substance.

In this context it is unfortunate that Leibniz, despite the fact that the topic is touched upon, does not elaborate on his view about what the relation between angelic substances and primary as well as secondary matter amounts to. He does suggest in a draft not sent to Des Bosses that angels are like humans and endowed with matter as well as a mind, with the difference that they are of greater perfection than human creatures are. This must be the case since "God alone is a substance without matter, for it is he who created matter itself"[280]. Presumably, Leibniz has here in mind matter as the immediate consequence of the creation of beings which could not but be limited, i.e. primary matter, and its derivative consequences. It is not only the lack of an extensive treatment that makes it difficult to evaluate Leibniz's view here. There is, in addition, what seems to be a tension between Leibniz's different presentations of his views on angels. On the one hand, he claims that "[t]hose who have made all angels corporeal creatures are rightly dismissed"[281], while he suggests, on the other hand, that angels are never completely separated from bodies[282]. Unfortunately, Des Bosses does not press Leibniz further on this point. But semi-religious discussions like this give Leibniz occasion to allude to additional functions matter serves. Among other things, he tries to incorporate the Peripatetic doctrine that numerical distinction requires a relation to determinate matter (except, of course, in God's case). "[I]t is natural for created things to have matter, [in the draft: (to be sure, secondary matter)] and they are not possible in any other way, unless God fulfils the function of matter through a miracle."[283] All these

[280] Leibniz to Des Bosses, 20 September 1706, LDB 61. The claim that God created matter might be one of the reasons why Leibniz refrained from sending this addition to Des Bosses, since it contradicts various assumptions concerning the origin of evil as based in matter as negative limiting principle in created substances, made also in the *Theodicy*, whose translation Des Bosses was preparing.
[281] Leibniz to Des Bosses, 20 September 1706, LDB 61.
[282] Leibniz to Des Bosses, 4 October 1706, LDB 69-71.
[283] Leibniz to Des Bosses, 16 October 1706, LDB 77.

discussions about angels and the function of matter unfortunately evolve primarily from considerations about secondary, rather than primary matter. But since secondary matter is derivative of and hence presupposes primary matter (of an infinite number of monads), it makes it plausible to assume that an angel's substantial form would also possess primary matter. And since angels seem, to a certain extent, to be similar to human beings and therefore might naturally (as opposed to metaphysically necessarily) endowed with a body or secondary matter, being metaphysically necessarily without primary matter (and therefore also secondary matter) is a privilege restricted to God:

> Primary matter is essential to any entelechy and is never separated from it, since it completes it and is itself the passive power of the entire complete substance; for primary matter does not consist in bulk, that is, impenetrability, and extension. Secondary matter, however, such as constitutes an organic body, is a result of innumerable complete substances, each of which has its own entelechy and its own primary matter, but none of these substances is perpetually attached to us. Thus the primary matter of any substance involves the primary matter of another substance existing in its organic body, not as an essential part, but as an immediate requisite, and for a time only, since one takes the place of another. Therefore, although God through his absolute power could deprive a substance of secondary matter, he nevertheless cannot deprive it of primary matter, for from this he would produce pure act such as he himself alone is.[284]

But Des Bosses quickly points out where he sees a problem with this account, namely that if any entelechy is inseparable from its primary matter, then all entelechies are created at the same time as matter was. But, according to religious teachings, human souls were created significantly later. Leibniz is not surprised by this objection and denies that this is indeed a problem, since he denies that the creation of new entelechies, in this case, human souls, requires that a new part of mass or additional secondary matter must be created alongside. This point might be, to some extent, surprising, since it suggests that there is no immediate and direct correspondence between the amount of primitive passive power and derivative passive power.

While Leibniz does not explicitly state it here, he presents, as we have seen,

[284] ibid., LDB 79.

elsewhere the view that for the constitution of secondary matter, an infinite number of entelechies and their primitive passive powers must be present. But for the creation of complete simple substances, it is not mass or secondary matter that is required, with which entelechies are combined in order to produce complete substances.[285] What is created is a complete substance that comes with its own primitive passive power, and which can then, once created, result in secondary matter when taken together with other monads.

> [T]he primary matter proper to an entelechy, that is, the primitive passive power that is inseparable from the active power, is created with the entelechy itself (which it completes, so that it constitutes a monad or complete substance). But this does not enlarge the mass, or the phenomenon resulting from the monads, any more than a point enlarges a line.[286]

And monads are indeed all Leibniz needs from a philosophical point of view in order to explain the appearance of matter, including our own bodies. With the pre-established harmony in place, he can claim that the union of soul and body amounts to the agreement of the expressions in the monads that are involved. But he seems reluctant to deny that there cannot be more to their relation, since by delivering an explanation in terms of pre-established harmony, "I do not thereby deny the metaphysical union of a complete substance, which belongs to a deeper inquiry and cannot be explained through the phenomena but also in turn does not offer a reason for the phenomena."[287] So two years into the correspondence, Leibniz does not yet see any need for a commitment to substantial bonds that render bodies genuine unified substances over and above to monads, not because he is certain that there is no such bond, but because he thinks such a bond and a further unification of mind and body into one corporeal substance would explain nothing that requires explanation.

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[285] Des Bosses falls into the trap of not carefully distinguishing between primary and secondary matter. He assumes that there is a uniform or general notion of 'matter' or a qualitative similarity between both notions, while they are in fact different in fundamental respects. Des Bosses has a notion of 'matter' in mind that stands for the type of stuff we assume to be present in the objects of our experience. But this secondary matter is not, strictly speaking, created in the same sense primary matter is, but it is grounded in or follows from the creation of primary matter.
[286] Leibniz to Des Bosses, 16 March 1709, LDB 119.
[287] Leibniz to Des Bosses, 3 September 1708, LDB 101.

But four years later Leibniz entertains the thought that if there is any corporeal substance that is genuinely rather than merely phenomenally real and existing over and above monads, then a real unifier needs to be superadded to monads, such that

> from the union of the passive powers of monads there in fact arises primary matter, which is to say, that which is required for extension and antitypy, or for diffusion and resistance. From the union of monadic entelechies, on the other hand, there arises substantial form; but that which can be generated in this way, can also be destroyed and will be destroyed with the cessation of the union[288]

But this substantial form, at least in this first and only preliminary introduction of a further unifying principle or substantial bond, is not a soul or simple substance; rather, this form and the matter it would unify would be in constant flux.[289] The fact that Leibniz decides to choose the same terminology in order to describe the constitution of substantial bonds or corporeal substances that he has already employed in describing monads, shows how confident Leibniz was concerning the explanatory function of these terms. And even though we find an introduction of corporeal substances and the further explanation of how they might come about, we might nonetheless have doubts about any sincere ontological commitment to them. The substantial bond seems to be merely introduced for anyone who wants to hold that bodies are real: If bodies are real, then there must be such a metaphysical union or substantial bond; otherwise, they will only be phenomena.[290] One of the reasons that require somebody to ascribe to the assumption that bodies are real might be motivated by religious considerations or the wish to be in accordance with Aristotelian hylomorphism. But Leibniz does indicate that he cannot see how such a claim could be also be philosophically motivated:

> But a soul in its changes persists as the same thing, with the same subject remaining, which is not the case in a corporeal substance. Thus, one of two things must be said: either bodies are mere phenomena, and so

[288] Leibniz to Des Bosses, 15 February 1712, LDB 225.
[289] One might doubt that there is genuine substantiality supplied by the substantial bond, and it might be better to think of it in an explanatory analogous sense of 'substantial form'.
[290] This is not unlike the train of thought already to be found in the Correspondence with Arnauld, see chapter 2.

> extension also will be only a phenomenon, and monads alone will be real, but with a union supplied by the operation of the perceiving soul on the phenomenon; or, if faith drives us to corporeal substances, this substance consists in that unifying reality, which adds *something absolute* (and therefore substantial), albeit impermanent, to the things to be unified.[291]

But if the 'realization of phenomena' is what is taken to be the important aspect, then Leibniz offers an alternative conception. The reality of bodies lies in their being phenomena in God, i.e. objects of his 'knowledge of vision': "God certainly sees things exactly such as they are according to geometrical truth, although likewise he also knows how each thing appears to every other, and thus he contains in himself eminently all the other appearances."[292] God considers monads, their modifications and relations; and it is through these relations that the things seem to us to form a unity. And this conception of a further unity that goes beyond the perception of finite monads can also serve to make more sense of the substantial bond, though the bond seemed to have been introduced independently of such considerations about it. One can, over and above these relations that finite substances perceive, conceive of a more perfect unity supplied by a more perfect perceiver, through whose perception a new substance arises from many substances, i.e. by which a certain substantiality is added. But one does not have to.

Within the correspondence, substantial bonds seem to serve two purposes. On the one hand they are a rather faltering attempt to account for transubstantiation – even though Leibniz does point out to Des Bosses that this is a pressing problem for the Jesuit rather than for himself. On the other hand, there is still the attempt to reconcile Leibnizian with Aristotelian principles. But, Leibniz makes clear, philosophically speaking, only monads are required and do have, if not under attack from attempts to establish an additional substantial bond, the merit of explaining not only the phenomena, but also of eliminating several major problems:

> I regard the explanation of all phenomena solely through the perceptions of monads agreeing among themselves, with corporeal substance excluded, to be useful for a fundamental investigation of things. In this way of explaining things, space becomes the order of coexisting phenomena, as time is the order of successive phenomena, and there is no absolute or

[291] Leibniz to Des Bosses, 15 February 1712, LDB 225-7.
[292] ibid., Supplementary Study, LDB 233.

> spatial nearness or distance between monads. To say that they are crowded together in a point or disseminated in space is to employ certain fictions of our mind when we willingly seek to imagine things that can only be understood. No extension or composition of the continuum is involved in this account either, and all the problems about points disappear. As I tried to say somewhere in my *Theodicy,* the difficulties concerning the composition of the continuum should warn us that we need to conceive of things very differently.[293]

Or, to put it briefly, "[t]he *hypothesis of mere monads* has this distinction, that, with it assumed, nothing remains unexplained, nor is anything assumed except what is proven and what must be assumed necessarily."[294]

3.4. Simplicity from 1690 to Des Bosses

It is not immediately clear why Leibniz feels the need to introduce substances that are essentially simple into his system, especially since he continues to describe their constitution in form of two primitive forces, i.e., in terms of substantial form and primary matter as coming together in one substance. In addition, he seems to have a wide variety of other terms to choose from, such as 'substantial atom', 'metaphysical point', or, of course, 'monad'. But there is a clear thread running through his thinking about substance: the question of unity and the question of grounding. Already in his younger years, Leibniz seems to be worried about how something extended, and hence essentially constituted of parts, can have genuine unity and he introduces minds and God as the guarantors of any unity and cohesion of corporeal substances. In the correspondence with Arnauld, this worry runs like a thread through a major part of the letters, but it seems not yet clearly determined what Leibniz thinks about corporeal, extended substances such as individual human beings in opposition to merely mind-like substances. The idea of complete individual concepts and of substantial forms as the ultimate subject of predication is already strongly reductionist and emphasises the role of forms over

[293] Leibniz to Des Bosses, 16 June 1712, LDB 255.
[294] Leibniz to Des Bosses, 24 January 1713, LDB 307

that of matter. In the 1690s he seems to draw the consequences from the picture and to commit himself finally to the explanatory superiority of substantial forms, and this commitment runs alongside an increase in worries concerning the possible unity of extended or aggregated things as well as concerning the nature of extension as such. To De Volder, he is more reluctant to clearly state his views on extension, but merely tentatively argues for some relative character of extension or the fact that it not a primitive notion. But it is clear, that as a relative notion, it requires grounding in properties that are not extended and that can supply the basis for at least a derivative or borrowed kind of reality of extended objects. To Des Bosses, he presents his view more explicitly: Extension is relational and hence reducible to the properties of a simple, active substance. Hence one of the driving motivations for keeping extended substances in business, a commitment to our common sense or our gut feeling that there are such things, seems to have been finally completely dropped. It becomes an essential feature of the most fundamental substance that it is not extended, and that it is simple or partless. But it is not only the character of extension itself that seems to drive Leibniz to this conclusion. There seems to be, in addition, a further worry about *anything* that is composed of parts. The basis for this worry might already be visible in his very early writings on the art of combination, where he first sets out a very liberal view on the composition of wholes, making them essentially dependent on some mind conceiving of its parts as belonging to one thing. But the criterion for belonging to one thing is rather loose and it merely requires that something in common is present in all the individuals that are taken to form such a whole. Similarly, the two diamonds found in the correspondence with Arnauld can be taken together as one thing, but whether they are far apart, close together or even encapsulated in one ring does not change anything about the fact that there are distinct things. Though Leibniz sometimes allows for some aggregated things, i.e. things consisting of parts of some sort, to be more rightfully referred to as aggregates, because the reason for considering them together is stronger than in other cases, he seems committed to the view that everything composed of distinct parts will, metaphysically strictly speaking, always lack essential unity or unity in a strong sense. The unity of aggregates comes in degrees, the unity of individual substances does not. Such a

problem would also concern the constitution of a simple substance, unless there is an account of its components, its substantial form together with its primary matter, that does not regard them as distinct components. There might be other possible options to account for their unity, but the one we seem to see entailed in scattered remarks throughout the writings from the 1690s on, is established by denying a real distinction between substantial form and primary matter, or indeed denying that there are two components at all. This also accounts for what seems to be an ambiguity in the portrayal of substantial form as being sometimes regarded as a substance and sometimes denied substantiality unless it is united with or 'completed by' primary matter. This primary matter does not add anything to the substantial form, but it rather is a limitation of it. We will see in the following that primary matter needs to be considered in order to make sense of the phenomena, the resistance and inertia they display, but that it is, in its explanatory function, essentially connected to a simple substance.

4. The Dynamics of Substance

The relation between Leibniz's metaphysical views and his ideas of what constitutes physical objects and grounds their behaviour is a difficult issue, especially since it sometimes seems as if Leibniz himself is not absolutely clear about how to think of this relation. We have already seen that Leibniz held the view that physics in some sense supplies a way into metaphysics,[295] and, hence, that we should view the objects or laws of physics to tell us something about the nature of substance and the realm of what lies beyond the perceived world. But before we try to find this entrance, honesty demands to explicitly point out a decision that seems to be necessary for approaching this subject, because it fundamentally changes the treatment of the texts on physics that will be reviewed in the following. We have seen that there is good reason to regard a simple substance ontology as being in place by the mid-1690s, possibly even earlier, or at least a system in which the behaviour of corporeal substances can be explained under the assumption of principles that are compatible with, or even are highly suggestive of, such a simple substance ontology. Then some of the seminal texts concerning Leibniz's dynamics, such as the 'Specimen Dynamicum', written and published in 1695, would be helpful indicators concerning the rather perplexing relationship between various kinds of forces in Leibniz's philosophy of physics. But this is by no means the only view available. One might find good grounds to think that there is a difference between the extension of 'substance' during those years and the classical monadology. Such a reading could, for example, suggest that there are corporeal substances as the bearers of derivative force in the 1690s, and therefore to view the relationship between physics and metaphysics, and the different forces associated with both, to be rather straightforward:

> In this view, it is relatively easy to fit the ontology of the SD [Specimen Dynamicum] and other dynamical writings directly into Leibniz's other metaphysical writings. In this view, the active and passive primitive forces

[295] See chapter 3.2.

> of the dynamics correspond reasonably well to the form and matter of the metaphysical writings. The derivative forces, then, emerge as modes of corporeal substance, and their reality in inanimate bodies is grounded in the corporeal substances that make them up.[296]

What grounds such a reading is not only the interpretation of several passages that suggest a commitment on Leibniz's part to corporeal substances – though, as we have seen in the previous chapters, other readings of these passages are equally possible – but it also in a very clear way illuminates why Leibniz insisted in his correspondence to De Volder that physics is the way into metaphysics. The experienced derivative forces of physical bodies are simply the qualities of corporeal substances. But I have argued that there are good reasons to think that a simple substance ontology is in place by the mid-1690s, and that corporeal substances understood in a way that they could serve as the paradigmatic objects of physics, i.e. as extended unified beings, are highly suspicious due to their lack of unity. Therefore, such an account needs at least some modification or clarification. For a reading of Leibniz's text such as the one I propose, the objects of physics and their derivative forces are primarily phenomena – despite their well-foundedness – and as such might correspond to the primitive forces and substances in a loose sense, but in a less straightforward way than it would be the case under a firm commitment to the existence of corporeal substances. Already the question of how the two kind of forces, i.e., primitive and derivative forces, might be related to each other now faces obvious difficulties. For one, the relation between the phenomenal and the substantial needs clarification, but also how the phenomenal, i.e. physics, can give access to the substantial, i.e. metaphysics. An account that relates Leibnizian physics to a simple substance account always faces, in addition, the threat of rendering physics a science dealing with the purely phenomenal, while Leibniz at the same time clearly took physics more seriously than that. But this is not how it should be viewed. Despite the fact that Leibniz thinks that the properties of physical objects, such as extension, are to a certain extent phenomenal, he does not suggest that they are merely subjective. Rather, he seems to maintain that there is a link between what he calls well-founded

[296] Daniel Garber, Garber, Daniel. "Leibniz: Physics and philosophy," in *The Cambridge Companion to Leibniz*, ed. Nicholas Jolley (Cambridge: Cambridge University Press, 1995), 296.

phenomena, e.g. the objects of physics, and the fundamental simple substances underlying them, such that it is possible to make claims about the latter based on the behaviour according to law-like patterns of the former and vice versa. But the fact that the relationship between simple substances and physical objects might be complicated by itself does not provide enough reason to attempt to reconstruct instead the seemingly simpler relationship between a corporeal substance and its derivative forces, especially once doubt has been cast on whether Leibniz is committed to corporeal substances at all. In addition, even if there are corporeal substances, their relationship to simple substances still requires explanation – unless one wants to deny that Leibniz is committed to simple substances in those years at all. The claim made previously that a simple substance ontology is already in place in the 1690s requires us to regard the physical writings of this period as an attempt to capture this more complicated relationship. But the aim of this reconstruction is, in any case, supported by textual evidence and therefore, hopefully, its plausibility is not entirely based on a strong commitment to the late monadological view.

One claim that seems to demand general assent is that, for Leibniz, the notion of force is a fundamental element in explaining any kind of activity in the world, on a metaphysical as well as on a physical level. The term itself enters into his writings by the late 1670s, but it gains a more precise and technical meaning only in the 1680s or 1690s,[297] when it becomes the most fundamental notion explaining the activity of substances as well as the motions of bodies.

We have seen already in the first letters his correspondence with De Volder that Leibniz regards the treatment of physics and its objects as in some sense prior to the treatment of substances, especially in the passages in which Leibniz insisted on treating the measure of force before going into the metaphysics of substance. Nonetheless, he claims in this very same correspondence that "the activity of substance is more of a metaphysical necessity, and unless I am mistaken, it would have had a place in every universe."[298] It seems as if there are two different priorities on the table in Leibniz's reasoning. Throughout his philosophical career, activity (alongside unity) is the mark of substance, and it often seems to be less

[297] Garber, "Leibniz: Physics and philosophy," 289.
[298] Leibniz to De Volder, Hanover, 3 April 1699, LDV 73.

supported by a conclusive argument, but rather appears to be either Scholastic heritage or assumed to be an a priori knowable attribute of substance. But there is another, a posteriori, argument for it, which is based on the order of discovery, so to speak, and sets out by analysing the objects we perceive, i.e. physical, extended, mobile things that behave in accordance with certain laws. This analysis might lead us to the more fundamental things, namely substances, and to the requirement of their necessary activity.[299] In order to explain why physical objects show this or that kind of motion or extension, there must be something permanent that is active and resistant, respectively, and therefore, as a permanent subject, able to ground these momentary and fleeting physical manifestations or limitations. We have seen that this is the way the discussion with De Volder proceeds, namely from an investigation of extended things in motion to the necessary existence of more fundamental active principles. This is also the general way in which Leibniz proceeds when arguing for the explanatory insufficiency of merely extended and passive (especially Cartesian) matter. As a result of this analysis, Leibniz feels entitled to claim that "in corporeal things there is something over and above [*praeter*] extension, in fact, prior to extension, namely, that force of nature implanted everywhere by the Creator."[300] But it is by no means obvious how these two levels and the various notions of force are connected, only that they stand in the some relation of mutual explanation and illumination, and that 'force' is a fundamental notion:

> [T]he concept of *forces* or *powers*, which the Germans call *Kraft* and the French *la force*, and for whose explanation I have set up a distinct science of *dynamics*, brings the strongest light to bear upon our understanding of the true concept of *substance*.[301]

This distinct science of dynamics was supposed to be set out in a book-length treatment entitled *Dynamica*, which – as many of Leibniz's ambitious undertakings –

[299] In accordance with this view is the fact that the 'Specimen Dynamicum', which prepares the way from physics to metaphysics is published prior to the 'New System' as a fuller metaphysical exploitation of its consequences.
[300] 'Specimen Dynamicum' (1695), GM VI 235/AG 118. It is noteworthy that Leibniz here does not only claim that there is something over and above extension, as he has put it to De Volder and others, but in addition something indeed prior to extension, similar to the picture in the correspondence with Des Bosses.
[301] 'De primae philosophiae Emendatione, et de Notione Substantiae' (1964): G IV 469/L 433.

was never finished.[302] But we get an introductory glance of his ideas in the published 'Specimen Dynamicum', in which Leibniz argues for the introduction of forces into natural philosophy. It is based on an assumption that he seemingly takes for granted – and quite rightly does so – , namely that we experience corporeal action of some sort, i.e. that we perceive moving bodies. It should be kept in mind that this experience does not entail the stronger claim that there actually exist such things as moving bodies. Even though they exist as objects of our experiences, the experience does not give us grounds for any assumptions concerning their ontological status beyond their being the content of a perception. But, so the argument goes, motion itself, once it is considered carefully and metaphysically accurately, turns out to be nothing really existing since it does not have coexistent parts and hence is never given as a whole:

> For, strictly speaking, motion (and likewise time) never really exists, since the whole never exists, inasmuch as it lacks coexistent parts. And furthermore, there is nothing real in motion but a momentary something which must consist in a force striving [*nitente*] toward change. Whatever there is in corporeal nature over and above the object of geometry reduces to this.[303]

While Leibniz misses the opportunity here to give a reason, we have already seen why this might be the case. Leibniz seems to regard motion as an aggregate of smaller motions, similar to extended objects being composed of extended parts to infinity. And if motion is something that is composed of smaller parts (and these smaller parts of smaller parts again, and so on), all these parts must be given in order for the whole thing to be given. And, analogous to the argument against aggregates (and, in his correspondence with Des Bosses, also against extension) as genuinely real entities, motion is divisible in smaller portions of motion to infinity, from none of which motion could not borrow its reality, because there is no grounding level of smallest indivisible motions to be reached. But in the case of motion there is also the further complication that even if its parts would exist, they would be given only successively and hence could not cumulatively give rise to one whole thing, but only to a temporal series of an infinite number of infinitely small,

[302] Garber, *Leibniz. Body, Substance, Monad*, 132.
[303] 'Specimen Dynamicum' (1695), GM VI 235/AG 118.

and hence fictional, things. Motion over time, it seems, has not only all the problems any infinitely divisible aggregate in general has, but due to its merely successive nature it can hardly be considered a thing at all.[304] Therefore, Leibniz concludes, the only thing that can be real in motion is something momentary, a force or striving towards change.[305] And, Leibniz claims, motion is the activity of *corporeal* objects. But by this time, Leibniz seems to have already abandoned the idea that such instantaneous forces, into which bodily motions must ultimately resolve, are something strictly speaking real.[306] So even if this is what everything "in corporeal nature over and above the object of geometry or extension reduces to"[307], the further question remains: What does it ultimately reduce to? Is it nothing but a fiction or does it have further grounding on a metaphysical level? We have seen that there has to be something beyond mere extension in physical objects, some kind of substantial form, possibly from the 1660s on, but now, thirty years later, Leibniz seems to have found the means to be more specific about its nature and what it can and does give rise to. By the mid-1690s, we find in Leibniz a more sophisticated view on the effects of forces and a more complex taxonomy of forces comprising two different types, namely primitive and derivative forces. Once these notions have become clearer, we might be able to assign them their place within Leibniz's overall systematic picture.

There are two ways to proceed, the one demanded by Leibniz in his correspondence with De Volder, which starts with a basic conception of physical phenomena and enters from there into the metaphysics of substance, or to start with the metaphysics of substance and to work our way towards a description of physical phenomena as well as to try to establish the relation between the two in this way. Despite the fact that this decision might have an influence on the outcome, after having already tried to establish the problems of physics and its

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304 This successive nature, though, must be different in kind from the successive nature we observe in simple substances. It is successive as a mere aggregation of momentous states, in difference to the essentially active simple substance that is not a sum of states, but essentially a force, analogous to the 'law of a series'.

305 On the relation between infinitesimals and derivative forces, see Rutherford, "Leibniz on Infinitesimals and the Reality of Force".

306 Richard T. W. Arthur, *Leibniz* (Cambridge: Polity Press, 2014), 79-85.

307 'Specimen Dynamicum' (1695), GM VI 235/AG 118.

objects prior to considerations concerning the nature of substance in the previous chapters, the second approach seems, for the moment, the easier route to go.

4.1. Primitive Active and Passive Force (the Metaphysics of Physics)

A year before the publication of the 'Specimen Dynamicum', Leibniz rolled out some preliminary thoughts on the importance of the notion of force for metaphysics in an article entitled 'On the Correction of Metaphysics and the Concept of Substance'. In this writing, he posits an active force which "contains a certain act or entelechy and is thus midway between the faculty of acting and the act itself and involves a conatus"[308], and which leads to action if it is not impeded in some way. In this writing, Leibniz does not yet introduce a clear distinction between the essential activity of substances and the activity of bodies, but it is already entailed in it: While matter (here in the sense of what constitutes the bodies of physics) is in motion, there is also a force that is the ultimate grounding for the matter's motion and that must, therefore, in some way be present in every body. While we can talk about bodies as limiting each other's motions by collision, i.e., regard them as behaving according to the standard mechanical view of Leibniz's time, which can be phrased in terms of causal interaction and the transmission of motion, "one created substance receives from another created substance, not the force of acting itself, but only the limits and the determination of its own preexistent striving or power of action"[309]. Here emerges a clear difference between possible descriptions of the objects of physics as well as their behaviour and the metaphysically fundamental substances. Metaphysical descriptions leave physical descriptions and phenomena untouched. There is a correct ascription of physical properties such as causal interaction and the transmission of force possible, despite the fact that it is, metaphysically strictly speaking, inaccurate. But we should keep in mind that this very short paper focuses on metaphysics rather than physical details, and hence some of the ideas are not spelt out in great detail. We see in it, nonetheless, a certain kind of relation indicated between bodies and substances: On

[308] 'On the Correction of Metaphysics and the Concept of Substance' (1694), G IV 469/L 433
[309] 'On the Correction of Metaphysics and the Concept of Substance' (1694), G IV 470/L 433.

the one hand, there is some force inherent in bodies that seems to be limited by the impact of other bodies, and these bodies display a behaviour that can be described in terms of causation and by the laws of motion and collision. On the other hand, there is a seemingly more fundamental kind of force which is found in substances. This force is never received from other substances, but only limited and determined from within itself. Hence, this should not be taken to be saying that there is a direct causal influence or passing on of a limit from one substance to another, especially since that the pre-established harmony is already in place in these years. It is rather the case that the passion of one substance requires the occurrence of an action in another suitably related substance (i.e. a substance standing in a particular relation of expression to the passive substance). Therefore, this limitation, though it is determined by the activity of another substance in form of an increase in the clarity or perfection of its expression, is not conferred onto the other substance. Both states must, rather, arise from within the involved substances themselves – and there must be, indeed, corresponding changes in all other substances, due to the universal expression of all the states of all monads by all other monads present in the same universe. Leibniz seems, even though he is not entirely explicit on it, to have a distinction between the forces displayed by bodies (what he will refer to as 'derivative forces') and the forces as they are constitutive of substances (later 'primary forces') in mind. An indication for the distinction being in place is the fact that we are given a criterion for differentiating between the two: One of them we can describe as if they were causally effective and therefore they behave according to laws we can know, while we perceive the other to act spontaneously, at least in the case we are best acquainted with: ourselves in introspection.

But what is also of great interest here is that the account of this short paper does not make any explicit reference to passive forces (though, as I have done above, it can be reconstructed in such a way that it implicitly does), and the main constitution of substance is presented in terms of 'active force' and 'the limits and determination of its [the created substance's] own pre-existent striving or power of action'. This looks as if Leibniz thought that a created substance, at least in its function of grounding the physical behaviour of bodies, can be fully spelled out in

terms of limited activity, without ascribing a second component, in addition to determined force, to this substance.

But a year later, he supplies his new science of dynamics with further, more elaborate definitions of the terms involved. In his 'Specimen Dynamicum' (1695) he introduces several distinctions that can be made among forces. First and foremost, forces are either active or passive, but those forces can each be further distinguished into primitive and derivative. We will here focus on the former ones and look at the derivative forces in the next section.

Leibniz introduces primitive active force or substantial form as something that is analogous to the soul. As we have seen, this is the familiar, but by no means the only, strategy Leibniz uses, namely to start by looking at things we have a closer or more intuitive access to and using them as paradigm cases. And due to a lack of reason to assume that we are significantly different in kind and constitution from the things around us, he finds himself licensed to generalize the ideas discovered in this familiar thing that is our soul. But this analogy has frequently been taken too literally by stressing the soul-likeness (and even more so the mind-likeness) of substantial forms and their having perceptions. It might be better, for the moment at least, to stick to the terms of activity and passivity, which can be discovered in our soul and hence ascribed to all other substances as well, without connecting these notions to perceptions and appetites. The primitive forces, Leibniz claims, must be "inherent in every corporeal substance per se", but they are not to be used to explain particular phenomena, whose explanation should be advanced in mechanical terms only. Leibniz sees primitive forces as more fundamental or ontologically prior principles that ground the behaviour of bodies and hence gives rise to the laws they obey, but which do not enter immediately into their explanation. This reasoning should be familiar by now, since it is to be found in Leibniz's writings from the 1660s onwards: Physics can be treated as a closed system and its explanations and laws, once established by experience and experiment, can explain the phenomena without recourse to metaphysics. But in order to understand the phenomena of physics, its own tools and terms are insufficient. While we can measure the forces of bodies, calculate their resistance and motion, we are not thereby given the means to explain them fully. In order to

do so, we must turn to metaphysics. This grounding metaphysical principle that 'gives rise to' these phenomena does not amount to an equivocation between primitive active forces and what they result in. We will also see that there is more to the phenomena than merely one primitive force, namely the coming together of an infinite number of them, that is required for giving rise to, but not composing, well-founded bodily phenomena. It is also interesting that here again it is the primitive active force that is described as inherent in every corporeal substance, rather than primitive forces as such.

Its passive counterpart is the "primitive force of being acted upon [*vis primitive patiendi*] or of resisting"[310], which can be also referred to as 'primary matter'. Due to its workings it is the case that bodies ultimately are impenetrable and oppose motion. In difference to primitive active force, which has the soul as an explanatory analogue, the notion of primitive passive force does not receive similarly extensive treatment. But so far, the difference between active and passive primitive forces is not only the different functions they fulfil or the phenomena they give rise to, but also the ways in which they can be characterized: Active forces are explicitly inherent in corporeal substances and understood to be like or similar to our soul, while primary matter so far amounts to 'being acted upon' and giving rise to resistance, impenetrability and inertia in bodies. In the case of primitive passive forces, we seem *prima facie* more familiar with their results rather than with them and their core metaphysical function or foundation. But the overall picture concerning the explanatory functions of primitive forces seem clear: "[I]t is on account of form that every body always acts, and […] it is on account of matter that every body is always acted upon and resists."[311] But why does Leibniz feel forced to introduce these notions at all? The primary incentive given for the introduction of these primitive forces is the fact that a purely geometrical treatment of bodies would lead, Leibniz claims, to predictions about the behaviour of bodies which do not correspond to their behaviour as we experience it.[312] Therefore, Leibniz claims,

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310 'Specimen Dynamicum' (1695), GM VI 236/AG 119.
311 ibid., GM VI 237/AG 120.
312 Leibniz himself had this problem in his younger years when composing his *Theoria motus abstracti* (1671). It, therefore, had to be accompanied by his *Hypothesis physica nova* (1671), in order to make

> we must admit something metaphysical, something perceptible by the mind alone over and above that which is purely mathematical and subject to the imagination, and we must add to material mass [*massa*] a certain superior and, so to speak, formal principle. Whether we call this principle form or entelechy or force does not matter, as long as we remember that it can only be explained thought the notion of forces.[313]

While we have seen in the correspondence with De Volder the attempt to enter the metaphysical realm via considerations of the notions of extension and activity of physical objects, Leibniz claims in the 'Specimen Dynamicum' explicitly that what is required in order to ground these objects and their properties is 'something metaphysical, something *perceptible by the mind alone*'. It is not the motions of body that are constituted by the motions of its grounding substances, but there must nonetheless be something that grounds these notions. And it is reason, rather than observation, that allows for this step from sense perception to a metaphysically viable system.[314]

When looking back on his development, Leibniz states that the prevalence of mechanism in his thinking was what brought him to occupy himself with mathematics.[315] And we have seen that the phenomena of physics have, for Leibniz, always been regarded as being explicable in geometrical or mathematical terms. But from his early writings on we see a gradual development from assuming substantial forms as the suppliers of motion and guarantors of unity of bodies to

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the application of the abstract laws to the actual world possible. See Garber, "Leibniz: Physics and philosophy," 273-277.

[313] 'Specimen Dynamicum' (1695), GM VI 241-42/AG 125.

[314] It is interesting to note that Leibniz makes reference here to the imagination as playing a role in physical and mathematical explanation, and juxtaposes it with the mind or the intellect. Unfortunately, the studies on the role of imagination in Leibniz's physics are very limited, one exception being Dennis L. Sepper, "Spinoza, Leibniz, and the Rationalist Conceptions of Imagination," in *A Companion to Rationalism*, ed. Alan Nelson (Oxford: Blackwell, 2005). It seems that by this reference Leibniz indicates the gap between the intellectual and the empirical realm, and the imagination rather than the intellect being the driving capacity in mathematical and physical reasoning. He writes to Queen Sophie Charlotte of Prussia in 1702: "Therefore, since our soul compares the numbers and shapes that are in color, for example, with the numbers and shapes that are in tactile qualities, there must be an *internal sense* in which the perceptions of these different external senses are found united. This is called *imagination*, which contains both *notions of the particular senses*, which are *clear but confused*, and the *notions of common sense*, which are *clear and distinct*. And these clear and distinct ideas, subject to imagination, are the objects of the *mathematical sciences*, namely arithmetic and geometry, which are *pure* mathematical sciences, and the objects of these sciences as they are applied to nature, which make up applied mathematics." (AG 187.)

[315] Letter to Remond (1714), G III 606/L 655

seeing in these forms the only explanatory principle that is required in order to ground the phenomena. The fact that we can give a thorough mechanical explanation of the phenomena, Leibniz seems to suggest, is the reason why we need to assume the presence of something more fundamental.

In these considerations of the reason as to why he introduced primitive forces, Leibniz returns again to the point of view we have already observed in 'On the Correction of Substance' (1694): The foundational role is played by the entelechy or primitive active force, and primitive passive force or primary matter does not seem to have any prominent place in this reasoning. The basis for this might be simple negligence on Leibniz's part or the assumption that the reader will immediately conclude that the same reasoning applies to primary matter. But there might be another support for the claim that we have already seen indicated in the more metaphysical writings: It is possible that 'entelechy' can stand legitimately for 'substance', the entity constituted by entelechy and primary matter or primitive active and passive force.

But these primitive forces do not only ground the possibility of corporeal substances to act and be acted upon, they are also required by the notion of extension. Since, as we have already seen in the De Volder Correspondence and elsewhere, Leibniz regards extension as a relative notion and, as he states in the *Specimen Dynamicum*, as something that "presupposes the substance of body, which involves the power of acting and resisting, and exits everywhere as corporeal mass [*massa*], and that the diffusion of this substance is contained in extension."[316] The 'substance of body' is not body considered as a corporeal substance, but it is the substance required for there to be bodies. This is illustrated in a text from the previous year. Here he writes that

> I prefer to say that the notion of force is prior to that of extension, because extension signifies a mass or aggregate of several substances, whereas force must exist even in a subject which is a single substance only; and unity is prior to multiplicity. It can even be said that force is constitutive of substance, just as action, which is the exercise of force, is its distinguishing

[316] 'Specimen Dynamicum' (1695), GM VI 247/AG 130.

> mark. For actions pertain only to substances, and pertain always to all substances.[317]

We see now that primitive force is not only metaphysically prior to the actions and passions of bodies, but also that it is prior to their extension, i.e., that it is not only prior to the derivative forces of physical objects, but also to what has been regarded by some, most notably Descartes, as their other fundamental attribute, namely extension. All these notions constitutive of physics are, as it turns out in thorough metaphysical analysis, not ultimately real but the result of more basic, unextended, forces.

But since the 'Specimen' itself leaves open how the two primitive forces are related to each other and only equates entelechy with primitive active force and primitive passive force with primary matter, it might look at first sight as if these are two distinct components (though, as I have argued, it does not need to be seen that way).

There are good grounds why we might intuitively think of them as distinct principles and to regard passive force as something that cannot possibly be mere privation or limitation. First of all, it is the notion of a 'force' suggests itself for reification. If something is a force, it should be something that acts. Here Leibniz's use of terminology might cloud the issue. Clearly, his passive force is defined as the 'force of being acted upon or of resisting' rather than in terms of any kind of action. It seems, that in his descriptions, he reduces the force of resisting to an action upon a subject rather than an action in its own right. But Leibniz might have had good reasons to call such a seemingly not itself active power 'force': It is, as the absence of primitive active force, only definable in terms of this active force. Taken by itself, without being taken as a limit of a fundamental active force, it cannot be described other than in terms of the phenomena it gives rise to. It is also, from a Leibnizian point of view, plausible to regard it and its derivative expressions as privations. The fundamental attribute of a substance is activity, but *qua* being a limited creature, this activity must necessarily be limited. This limitation is what gives rise to the resistance that bodies display, rather than

[317] 'Reflections on the Advancement of True Metaphysics and Particularly on the Nature of Substance Explained by Force' (1694), WF 34.

constituting an active force of resisting. If bodies were not limited, they would neither display impenetrability or inertia nor extension. God, as an absolutely active being, does not display these properties at all. Resistance is rather an approximation to the state of absolute passivity, which would be displayed in bodies at absolute rest. (But since no grounding principle and therefore no body can be absolutely passive, they also can never be at absolute rest.)[318]

These two forces are unified again in the following years by the introduction of the term 'dynamicon' (or 'dynamism') that we have already encountered in the correspondence with De Volder. In a paper of 1702, entitled by the translators as 'On Body and Force, Against the Cartesians', Leibniz supplies us with a somewhat clearer idea of what this unity or dynamicon might be. Here, again, the starting point is extension as a relative notion and hence as something that requires something else which is extended or diffused. And he admits that the nature of that which is extended requires further elaboration: "[M]atter consists in the diffusion of resistance. But since on our view there is something besides matter in body, one might ask what its nature is. Therefore, we say that it can consist in nothing but the *dynamicon*, or the innate principle of change and persistence."[319] "Furthermore," Leibniz continues, "the *dynamicon* or power [*potentia*] in bodies is twofold, passive and active. Properly speaking, passive force [*vis*] constitutes matter or mass [*massa*], and active force constitutes entelechy or form. Passive force is resistance itself…"[320] There is a tension in this passage in the juxtaposition of entelechy and matter here, since, in difference to what we have seen before, it seems to be constructed not between primitive active and primitive passive force, but rather between primitive active force (entelechy) and secondary matter (*massa*). Mass, as we have seen in the De Volder correspondence, is "the secondary matter, i.e., the organic machine, for which innumerable subordinate monads come together"[321]. But this equation of matter with *massa* or secondary matter in this passage might equally well echo the description of monads as seen in the correspondence with De Volder, since in the same text we also find that primitive

[318] For some possible objections and replies to this view of passive forces, see Antognazza, "Primary Matter, Primitive Passive Power, and Creaturely Limitation".
[319] 'On Body and Force, Against the Cartesians' (1702), G IV 394/AG 251.
[320] ibid., G IV 395/AG 252.
[321] Leibniz to De Volder, 20 June 1703, LDV 265.

active force is the "natural principle which, together with matter or passive force, completes a corporeal substance. This substance, of course, is one per se, and not a mere aggregate of many substances, for there is a great difference between an animal, for example, and a flock."[322] And Leibniz immediately goes on to explain that this primitive active force or entelechy *furthermore* activates some organic body, which is a machine of nature and hence an infinity of entangled organs, i.e. which is the mass or secondary matter. This mirrors the description to De Volder and the different aspects of substance as

> (1) the primitive entelechy, i.e., the soul; (2) matter, namely, primary matter, i.e., primitive passive power; (3) the monad completed by these two things; (4) the mass, i.e., the secondary matter, i.e., the organic machine, for which innumerable subordinate monads come together; and (5) the animal, i.e., the corporeal substance, which the monad dominating in the machine makes one.[323]

In further support of this reading, the notion of a dynamicon in this Anti-Cartesian work of 1702 can be related to its appearance in the correspondence with De Volder: "And so I believe that our thinking is completed and terminated more in the notion of dynamism than in that of extension, and no other notion of power or force should be sought than that it is an attribute from which change follows whose subject is substance itself."[324] This dynamicon is also in this letter the nature that is diffused in extension and it is nothing other than the "dynamism, from which there is action and passion"[325]. Another indication for the close connection between the two primitive forces is found in the explanation of them as being incomplete without the other: Incomplete "is the passive without the active, and the active without the passive"[326]. This indicates that while it is possible to view the primitive active and passive forces as fulfilling different functions, ontologically we deal with only one principle, the dynamicon, which incorporates the two.

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[322] 'On Body and Force, Against the Cartesians' (1702), G IV 395/AG 252.
[323] Leibniz to De Volder, 20 June 1703, LDV 265.
[324] Leibniz to De Volder, 3 April 1699, LDV 73.
[325] Leibniz to De Volder, April 1702, LDV 241.
[326] Leibniz to Bernoulli, GM III 542/AG 167.

It seems clear that a real unity, if it is a created substance, consists of a primitive active and a primitive passive force. But how are these two related? For once, we have seen that Leibniz does not always regard it as necessary to take primitive passive force into account, which suggests a similar treatment of primitive passive force that we have seen beforehand concerning the distinction between entelechy and primary matter, where it was suggested that what is essential and positive in a substance is indeed its entelechy. Its passive ingredient, on the other hand, fulfils an important explanatory function, but it is, metaphysically strictly speaking, not an individual component of a substance. One should read the suggestion concerning the limitation of primitive forces in a similar vein:

> It will be apparent from our meditations that one created substance receives from another created substance, not the force of acting itself, but only the limits and the determination of its own pre-existent striving or power of action.[327]

Here Leibniz indicates that the *only* property required for adequately describing substances is their essential activity and the limitation thereof. And, so it seems, what is defined in the correspondence with De Volder as "(3) the monad completed by these two things [i.e. of the primitive entelechy and primary matter/primitive passive power]"[328] is referred to in his more dynamical writings as the *dynamicon*, one principle that is the essential constitution of a substance and gives rise to the phenomena physics describes.

But despite the importance Leibniz gives to the notion of primitive force in explaining the notion of substance, he remains in his physical writings surprisingly vague concerning its nature: The nature of substance needs to be understood in analogy with our soul or the 'I' (an analogy that seems *prima facie* rather unhelpful in an account of the foundations of physics, unless one wants to establish a thorough phenomenalism) and it is required in order to explain the behaviour of bodies and the nature of physical explanation. But maybe we can get a clearer picture of what these primitive forces are by contrasting them with derivative forces, whose properties they give rise to despite the fact that they possess these properties, as we

[327] 'On the Correction of Metaphysics' (1694), G IV 470/L 433.
[328] Leibniz to De Volder, 20 June 1703, LDV 265.

will see, only in a very different way. This might only give us for the moment a predominantly negative definition, but will nonetheless prove useful.

4.2. Derivative Active and Passive Force (Physics and its Objects)

Derivative forces as such seem to tell us surprisingly little about the details of the fundamental substances or real unities, even though they form, as a part of what we perceive in the world, a partial basis for the investigation that ultimately leads to these unities. But there is, nonetheless, a connection between derivative and primitive forces, since derivative active forces result from a limitation of primitive active forces through the collision in bodies and are therefore found in different degrees, Leibniz claims:

> Active force (which might not inappropriately be called power [*virtus*], as some do) is twofold, that is, either primitive, which is inherent in every corporeal substance per se [...] or derivative, which, resulting from a limitation of primitive force through the collision of bodies with one another, for example, is found in different degrees.[329]

This characterisation is slightly cryptic, but it might incorporate just a twofold claim. On the one hand, any derivative active force is a result of primitive actives forces, but it can also be regarded as being determined by the collision on the physical level. This double characterization is in line with Leibniz's insistence that the behaviour of bodies can be explained in purely mechanical terms, but is ultimately or fully explicable only with recourse to metaphysics. There are two options how this double explanation is possible: Either there is a law-like derivative relation between the fundamental active but limited substances that give rise to the phenomena, or a more phenomenalistic explanation in terms of the pre-established harmony that obtains between the unities from which they are derived. But the former seems to be ruled out by Leibniz's claim towards Des Bosses that an increase in monads or primitive powers in a mass does not correspond to an increase in the mass itself:

[329] 'Specimen Dynamicum' (1695), GM VI 236/AG 119.

> [N]ew entelechies can be created even if no new part of mass will be created; for even if a mass already contains unities everywhere, nevertheless it always acquires new ones, which are dominant with respect to many others. […] Moreover, the primary matter proper to an entelechy, that is, the primitive passive power that is inseparable from the active power, is created with the entelechy itself (which it completes, so that it constitutes a monad or complete substance). But this does not enlarge the mass, or the phenomenon resulting from the monads, any more than a point enlarges a line.[330]

Analogously, derivative passive force is a consequence of primary matter and shows itself in different degrees in secondary matter,[331] i.e. it is a consequence of an infinite number of limited monads coming together without being merely an aggregate of those primitive passive powers. (Especially on an account that assumes that primitive passive powers are nothing but privations, it seems clear why derivative passive powers cannot be an aggregate: What amounts to nothing can not be aggregated.) But this seems even more puzzling, given that 'secondary matter' is by Leibniz understood to be "the organic machine, for which innumerable subordinate monads come together"[332]. But then again, this showing itself in secondary matter might amount to nothing more than claiming that it is the basis for the organic machine as a whole to show resistance and impenetrability.

While Leibniz emphasizes that, strictly speaking, there is no interaction between individual things, neither substances nor bodies, he allows for derivative forces to be that by which bodies are said to actually act on other bodies and be acted upon by other bodies. These derivative forces are connected to local motion and they are, furthermore, the basis of explanation for all other material phenomena.[333] But as that which is to a great extent dependent on being perceived by us to obtain in the physical interaction of extended things or as that which seems to constitute the nature of these extended things, derivative force is something changeable and hence something modal, i.e. a modification of something persisting, something more absolute. It is a modification "not of something merely passive (otherwise the modification or limit would involve more

[330] Leibniz to Des Bosses, 16 March 1709, LDB 119.
[331] 'Specimen Dynamicum' (1695), GM VI 237/AG 120.
[332] Leibniz to De Volder, 20 June 1703, LDV 265.
[333] 'On Body and Force, Against the Cartesians' (1702), G IV 400/AG 256.

reality than that which is limited), but of something active, that is, of a primitive entelechy."[334] Leibniz is not explicit here, but we can see several reasons why he might assume that something changeable must be based on something more permanent. Clearly, there cannot be modifications as such, but only modifications of something. And these things that derivative forces are modifications of are primitive forces. Furthermore, as momentary modifications of things, given Leibniz's view of infinitesimals as fictions, they are not absolutely real, because as existing for only an instant, they would be required to be smaller than an assignable quantity, hence being useful fictions in calculation, but not real. Though this does not lead us directly to monads, it explains why bodies and their forces are phenomena – even though well founded ones – rather than fully real entities:

> I consider bodies to be the same kinds of things as corporeal forces, namely to be among the phenomena, if, indeed, they are understood to superadd anything to simple substances and their modifications, just as we say, not improperly, that a rainbow is a thing, even if it is not a substance, i.e., it is a [real, i.e., well founded,] phenomenon [that does not disappoint the expectations of one who proceeds rationally]. And in fact, not only sight but touch has its phenomena [, and corporeal masses are like this, as are beings of aggregation, whose unity comes from a perceiver].[335]

4.3. Forces and their Relation to Simplicity

There are connections between forces and simplicity on several levels. In treating derivative or phenomenal forces in purely mechanical terms, Leibniz holds that "when I assign certain motions to bodies, I do not and cannot have any reason other than the simplicity of the hypothesis, since I believe that one can hold the simplest hypothesis (everything considered) as the true one"[336]. On the face of it, this is just a simple statement of Leibniz's version of Ockham's razor, and it seems to consider only what means to regard a physical hypothesis to be true. The reasoning seems to be that, for phenomena, whatever is the simplest assumption,

[334] 'On Body and Force, Against the Cartesians' (1702), G IV 397/AG 254.
[335] Leibniz to De Volder, January 1705(?), LDV 319.
[336] Letter to Huygens, 4/14 September 1694, GM II 199/AG 308.

can be regarded as true. This is based on Leibniz's view that God's perfection in creating the world manifests itself in "the simplicity of the ways is in balance with the richness of effects"[337]. But it seems to be more important than just that: Even though these physical phenomenal effects result from the activity of substances, judging only by the appearance does not allow us to determine which of the objects we observe are in fact in motion. This should make us suspicious: If the activity of substances is concluded from the behaviour of the phenomena, but we cannot ascribe with certainty which objects are in motion, then we probably also cannot know the specific degree to which the underlying substances are active, and possibly not even which substance are overall more active than passive. While this would entail a certain degree of scepticism, it seems to be the view Leibniz would need to resort to: The fundamental substances, despite being to a certain degree active and to a certain degree passive, do not seem to have the kind of force or activity that is measurable and with certainty ascribable for us.

But there is another, but related, fundamental difference that makes this ascription of amounts of active and passive force to the fundamental unities almost impossible, rather than merely epistemologically difficult to access: One of their main differences between primitive and derivative forces is the fact that only the latter are quantifiable and hence measurable. They appear to us as continuous, measurable quantities that we can calculate and describe by assuming that they are composed of infinitesimal instances: We can describe all kinds of motions as if they were composed from infinitely small, instantaneous amounts of motion.[338]

The primitive forces, on the other hand, are the fundamental forces that are in a certain sense simple and not composed of any units. They are not composed of an infinite number of infinitesimal quantities, but they are themselves essentially qualitatively but not quantitatively determined, active and simple unities that

[337] *Discourse on Metaphysics* (1686) §5, AG 38.

[338] Rutherford suggests that "in designating a substance's derivative force, we are not referring to any entity over and above the substance itself; we are referring simply to some way or mode in which the substance exists – a mode in which it exhibits such-and-such tendency to change." (Rutherford, "Leibniz on Infinitesimals and the Reality of Force," 277.) He thinks, therefore, that the mathematical strategy of reconstructing them in terms of infinitesimals is merely a heuristic tool, since infinitesimals are fictitious and would render derivative forces fictitious or phenomenal. But since there is good reason to think that there is an explanatory gap between primitive and derivative force, it is possible that Leibniz indeed though of the latter as infinitely divisible and phenomenal (i.e. in the same way he thinks about extended matter).

ground everything else, including the appearance of measurable properties of physical objects.

Nonetheless, even though we might not be able to pin down exactly which substance in an aggregate will contribute to what extent to the behaviour of the aggregate, it is nonetheless necessary that they form the basis and that the behaviour of physical objects is in a cerain sense reducible to them. Hence the pragmatic view of physics is at the same time bound to an overall metaphysical reduction of physical phenomenal effects or qualities to one fundamental explanatory principle, namely force in the sense of the *dynamicon*, which shows itself in the physical and quantitative science, but also in a variety of, or indeed in all, other experiential phenomena. That the objects of physics are fundamentally reducible to substances each constituted by one simple principle is also what Leibniz claims in opposition to the Cartesians:

> Moreover, alteration, though, like qualities, appears to be of many sorts, in the final analysis, reduces to the variation of forces alone. For all qualities of bodies, that is, except for shapes, all of their real and stable accidents (that is, those which do not exist merely in a transitory way, like motion, but which are understood to exist in the present, even if they make reference to the future) are in the end reduced [*revoco*] to forces, when analysis is undertaken. Furthermore, if we set forces aside, then nothing real remains in motion itself, since from change of place alone one cannot determine where the true motion or the cause of change really is.[339]

This also leads to an order of sciences: Physics makes use of principles from two mathematical sciences, geometry and dynamics, and hence is subordinated to them. Geometry itself, as the science of extension, is subordinated to arithmetic due to the repetition found in extension, as well as to dynamics, which in turn is subordinated to metaphysics, which treats cause and effect.[340] But this order of sciences does not amount to a full reduction of what we can know about physics to two fundamental sciences, i.e., to metaphysics and arithmetic. There is still a difference between the metaphysical primitive forces and derivative forces *for us*. And this difference is phrased by Leibniz in a terminology familiar from his accounts of the composition of aggregates from monads: "The primitive force of

[339] 'On Body and Force, Against the Cartesians' (1702), G IV 400/AG 256.
[340] ibid., G IV 394-95/AG 251-2.

bodies is indefinite in itself, but it results in secondary force, which is like a determination of primitive force, and arises from the combinations and collisions of bodies."[341]

The indefinite character of primitive force that results in secondary force reminds strongly of the simple unextended substances that result in extended things, as, for example, body is, reducible or resolvable, since "a corporeal mass that is believed to have something besides simple substances is not a substance but a phenomenon resulting from simple substances, which alone have unity and absolute reality."[342] What seems to be an overall reduction to monads proves more difficult once a closer look is taken. It is real unextended unities that give rise to extension; and it is the explanatory principles that can be spelled out in terms of 'form' and 'primary matter' or in terms of primitive powers that give rise to the derivative forces, but to some extent there still seems to be a distinction to be made between the phenomenal and the metaphysical.

It is clear that Leibniz tries to reduce the system of science he is building to as few hypotheses and principles as possible. It is the metaphysical that gives rise to the physical, and even though it is not clear how this happens, it is a necessary assumption in order to explain the observed behaviour of physical objects. But Leibniz is able to put these observations and the origin of their phenomenal character into the individual substances as well:

> Besides, you will easily see from this that material substances are not destroyed but conserved, provided that they are sought in dynamism, which reveals itself through the phenomena, i.e., in the active and passive force of perceivers, not outside of them. But extension, like time and bulk and the motion that consists of their variations, disappears into the phenomena no less than real qualities do, and exists, as Democritus said, more by convention than in reality.[343]

But derivative forces have another feature in common with extended things: They are aggregates. As such, they face the same problems of constituting a whole, and hence the demand that, in order to be real, they be reducible to

[341] Leibniz to Bousset 1694, WF 34.
[342] Leibniz to De Volder, January 1705(?), LDV 319.
[343] Supplement 2, Leibniz to De Volder, 19 January 1706, LDV 339.

something basic and not aggregated. Primitive forces as the basis for derivative forces hence seem to be constituted by a conatus that is itself simple and not further resolvable as well. This underlying primitive force cannot be composed of any kind of parts, since a composition of infinitely small units of force would render them fictitious.[344]

[344] That Leibniz might have realized at some point – though maybe not entirely clearly – that he introduced a gap between primitive and derivative forces can be argued also with recourse to a rather different problem: The increase of perfection in the world. Once perfection is connected with force, as we will see in the next chapter, is plausible, it becomes apparent how Leibniz, who was adamant to maintain that the quantity of force in the universe, at least on the derivative level, i.e. as physical force, remains the same, could have nonetheless incorporated the idea that the universe increases in perfection on a metaphysical level. This reasoning might lend itself to give a deeper explanation on why Leibniz did not seem to hold a consistent view on whether the world increases in perfection. (For an exposition of the problem, see Lloyd Strickland, "Leibniz on Whether the World Increases in Perfection," *British Journal for the History of Philosophy* 14.1 (2006).)

5. Theological Considerations

5.1. Is God a Monad? The Hierarchy of Substances and Degrees of Perfections.

In the analysis of simple substances, emphasis is sometimes put on Leibniz's metaphysical and physical writings, but there is good reason to take his intertwined theological considerations into account as well. Not only is there a long tradition Leibniz feels free to draw from and to modify according to his needs,[345] but the attempt to reconcile metaphysical and theological claims itself is also of utmost importance to him throughout his life and therefore his views on God's nature, creation, and the origin of evil are strongly connected to his philosophical views.

Simplicity itself as an attribute of God is an integral part of the traditional understanding of a Christian God,[346], a tradition Leibniz himself is a part of (though it is also found in other monotheistic religions[347]). Leibniz is explicit in his commitment to this assumption as well: "[...] God alone is the primitive unity or the first [*originaire*] simple substance [...]"[348]. Though it seems to be obvious, in this case, that Leibniz receives this idea of divine simplicity from the preceding tradition, considering his conception of a simple God might give insight into his theory of substance for several reasons. Firstly, the case of divine simplicity involves a problem analogous to a general puzzle arising from Leibnizian simple substances: How to conceive of the relation of a multitude of properties with something absolutely simple. The analogous case concerning substances in his mature philosophy would be the question as to how an individual simple substance

[345] For a connection of Leibniz's conception of evil with the Scholastic tradition, see especially Antognazza, "Primary Matter, Primitive Passive Power, and Creaturely Limitation" and Duarte, "Leibniz and Prime Matter".
[346] Cf. Thomas Aquinas, *Summa Theologica* I, q.3.
[347] See David B. Burnell, *Knowing the Unknowable God. Ibn-Sina, Maimonides, Aquinas*. Notre Dame: University of Notre Dame Press, 1986, 35-50.
[348] Monadology §47, G VI 641/AG 219.

can have a multitude of properties in the form of an infinite number of perceptions and limited perfections. Thus, as one needs to account for the infinite multiplicity of perceptions in one created simple substance, one also needs to account for (an infinity or at least several) attributes in one simple divine substance. But there are also important considerations concerning the similarity between God's simple nature and its imitation by monads and the questions in which sense various divine perfections can enter into the constitution of simple substances.

But at this point it is unclear if Leibniz considers God to be a substance of the same or of a different kind than his creatures. Only if they are of the same kind we seem entitled to apply considerations concerning divine substance to the creatures that follow from him.[349] One evident difference between the two is the fact that God, in difference to his creation, is absolutely independent: "It must be admitted, Sir, that we are not completely free; only God is completely free, since he alone is independent."[350] Though one might attribute certain other kinds of independence, such as a predicative independence (as the ultimate subject of predication) to individual substances[351], or causal independence of each created substance from all other created substances (as assumed in the *Discourse* as well as in the monadological writings), everything created is nonetheless in certain fundamental ways dependent on God.[352] So there is a difference between created substances and creator as the latter is absolutely independent, while this can only be claimed in a restricted sense for the former. But is this sufficient to establish a difference in kind? There are also good grounds for assuming that God and created substances are of the same kind of substance. First and foremost, the core of Leibniz's definition of substance is activity and unity, but not independence. The difference between creator and creatures manifests itself, furthermore, not in the possession of different qualities, but only in different degrees of those qualities.

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349 "God alone (from whom all individuals emanate continually and who sees the universe not only as they see it but also entirely differently from all of them) is the cause of this correspondence of their phenomena […]" Discourse §14 AG 47. The terminology of emanation suggests a closer, Platonic relation between divine and creaturely perfections, but this of less relevant here. For a possibly reconstruction of a Platonic emanation theory in Leibniz, see Mercer, *Leibniz's Metaphysics: Its Origins and Development*, especially 190-192.

350 'Dialogue effectif sur la liberté de l'homme et sur l'origine du mal' (25 January 1695): Gr 362/AG 112.

351 See chapter 2.

352 This is not only true about their origin, i.e. creation, but also in their relation to continued existence.

This seems for Leibniz sufficient reason to establish a strong connection between the constitutions of them:

> [T]he soul is an imitation of God as far as is possible for a created thing, for like him it is simple and yet also infinite, in that it contains everything implicitly through confused perceptions – though with respect to clear perceptions it is limited, whereas everything is clear to the sovereign substance, from which everything emanates, which is the cause of existence and of order, and is in a word the ultimate reason for things. God contains the universe eminently, and the soul or unity contains it actually, being a central mirror, though active and vital, so to speak.[353]

God might therefore serve as some kind of blueprint, having the qualities of created substances, but in their highest degree, while the qualities of substances could also serve in turn to illuminate the notion of God. Already in the 'Dialogue effectif' of 1695 Leibniz claims that all created things "are bounded or imperfect by virtue of the principle of negation or of nothingness they contain, by virtue of the lack of an infinity of perfections in them"[354]. We see here again Leibniz's general strategy of explaining the nature of substance in a reductionist way, constructing it out of one essential positive principle and its limitation.

There is, as Adams put it, "a general top-down theory of the *constitution* (and not just the causation) of the constitutive properties, or *realities*, of finite things as deriving their positive content from those of the infinite being"[355]. In this sense, God is not only the reason for the actuality of individual substances, but also of the degree of their reality or perfection. This sits well with the idea of a complete concept or the determination of substantial forms by their individual laws, and the extent of divine foreknowledge in general, but also with the therein implied reductionist program. At first sight, Leibniz's definition of a 'perfection' seems to be clear: "(1) They must be qualities rather than, say, relations. (2) They must be simple. (3) They must be positive – metaphysically and not just verbally. And (4)

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[353] Letter to Bayle (1702?), G III 72/WF 132.

[354] Gr 364/AG 114; see also Discourse on Metaphysics (1686) §30: "And it is to this [i.e. an original imperfection or limitation connatural to all creatures], in my view, that we must reduce the opinion of Saint Augustine and other authors, the opinion that the root of evil is in nothingness, that is to say, in the privation or limitation of creatures" (G IV 455/AG 62).

[355] Robert Merrihew Adams, "The Priority of the Perfect in the Philosophical Theology of the Continental Rationalists," in *Rationalism, Platonism and God*, ed. Michael Ayers (Oxford: Oxford University Press, 2007), 91-116; 103; for a further development of this claim, see Maria Rosa Antognazza, "Comments on Adams' 'The Priority of the Perfect," in *Rationalism, Platonism and God*, ed. Michael Ayers (Oxford: Oxford University Press, 2007), 118-128.

they must be absolute; that is, they must express or possess their content, their reality 'without any limits'."[356] Here, Adams seems to suggest that there is a univocal use of 'perfectio' in Leibniz's writings, but this does not seem to be straightforwardly the case. *Prima facie*, there are at least three slightly different uses of the term in Leibniz writings, namely *perfectio* as (a) a property which allows for a maximum[357], (b) the perfection-in-the-maximum, e.g. omnipotence, omniscience etc. (i.e. perfection as it is possessed by or attributed to God), and (c) a degree of perfection, i.e. as *quantitas essentiae*[358]. And in this last sense, they do not seem to be in accordance with Adams's general definition of perfection, since perfections of creatures are necessarily limited but are nonetheless referred to 'perfections'. This last definition has, in addition, the further implication that referring to it as 'quantity' [quantitas], they seem to run the risk of being comparable and composed of parts.[359] But since they allow for degrees or limitations, it seems required that they are composed in some way, for example, as Adams suggests, by certain logical operations, namely negations, and thus seem to be neither simple nor purely positive; they do not qualify as perfections according to the criteria proposed by Adams, even though he (and Leibniz) seems to acknowledge them as such. He attempts to reconstruct the properties of creatures through the limitation of God's simple properties based on the introduction of a special operator that results in 'limited perfections'. Though it is a difficult task to give a plausible explanation of how God's simple perfections may be limited (even more so if one wants to hold

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356 Adams, "Priority of the Perfect," 105.

357 We must also know what a perfection is. A fairly sure test for being a perfection is that forms or natures that are not capable of a highest degree are not perfections, as for example, the nature of number or figure. For the greatest of all numbers (or even the number of all numbers), as well as the greatest of all figures, imply a contradiction, but the greatest knowledge and omnipotence do not involve any impossibility. Consequently, power and knowledge are perfections, and, insofar as they belong to God, they do not have limits. (Discourse §1, G IV 427/AG 35.)

358 "Furthermore, in order to explain a bit more distinctly how temporal, contingent, or physical truths arise from eternal, essential or metaphysical truths, we must first acknowledge that since something rather than nothing exists, there is a certain urge for existence or (so to speak) a straining toward existence in possible things or in possibility or essence itself; in a word, essence in and of itself strives for existence. Furthermore, it follows from this that all possibles, that is, everything that expresses essence or possible reality, strive with equal right for existence in proportion to the amount of essence or reality or the degree of perfection they contain, for perfection is nothing but the amount of essence [*essentiae quantitas*]." ('On the Ultimate Origination of Things' (1697), G VII 303/AG 150.)

359 Such a construction of perfections and their comparability would give rise to Broad's concern that creatures, when compared with God, would turn out to be infinitely evil, since they would lack an infinite degree of perfection. (C. D. Broad, *Leibniz. An Introduction* (Cambridge: Cambridge University Press, 1975), 159.) We will see below how this worry might be circumvented.

that they are simple), Leibniz's approach to this issue shows that there is a qualitative similarity between the divine and all other individual substances. Taking this into account, there is a construction suggested by what has already been said, namely that the negation that leads to limited substances is not an operation in form of taking away some part, performed on the conception of the most perfect monad, but rather a function of privation or non-being. Another reason for such a reconstruction can also be found in Leibniz's general attitude towards the constitution of the infinite in general:

> Unlike the notion of a number, the notion of God (and, in fact, of any true being, of which God is the most perfect) is, according to Leibniz, a notion of something that is not produced by composition of parts, that is, it is not something that is made up (per impossible) by composing or conjoining an infinite number of units or perfections. God (and any created Leibnizian being) is not a sum of perfections. In fact, a being for Leibniz is not a sum at all; rather, it is an active agent and, in this sense, it is one and indivisible. […] Such a unity cannot be fully defined in terms of its constituents and in this sense admits of no parts.[360]

One worry concerning this reconstruction is how divine perfections can be limited in a way that they ultimately explain the constitution of substance. Even if one accepts that God is a simple substance with simple properties[361], these properties seem to be fundamentally different in created substances, because they seem, *qua* capability of being limitable, to be complex rather than simple properties. In a straightforward way, to be limited or partially negated seems to require a composition of the quality in question of several parts, some of which are negated in the case of a limitation. But such a composition, as we have seen, seems to be ruled out by Leibniz due to his considerations of the infinite in actual beings. (It seems clear that a simple negation of a divine perfection as such would be too strong – since created substances are essentially limited and do not possess any divine perfections in an unlimited degree, it seems that simple negation would render created substances without any perfections whatsoever.) Leibniz himself is

[360] Ohad Nachtomy, "Leibniz on Infinite Beings and Non-beings," in *The Rationalists. Between Tradition and Innovation*, ed. Carlos Fraenkel et al. (Dordrecht: Springer, 2010), 187-88.
[361] Despite the further worry that, as Adams also point out, it is far from clear why we should accept divine qualities as simple and not further analysable. (Adams, "Priority of the Perfect,",111-116.)

not particularly helpful on the issue and one analogy he draws, between perfection and nothingness, seems to suggest the view of simple negation:

> And this is the origin of things from God and nothing, positive and privative, perfection and imperfection, value and limits, active and passive, form (i.e. entelechy, endeavour, energy) and matter or mass which is in itself inactive, except insofar as it has resistance. I have made those things clear to some extent by the origin of numbers from 0 and 1, which I have observed is the most beautiful symbol of the continuous creation of things from nothing, and of their dependence on God. For when the simplest progression is used, namely the dyadic instead of the decadic or quaternary, all numbers can be expressed by 0 and 1, as will be evident in the table I have added, and in this genesis of numbers, which is especially suitable for nature, many things lie hidden that are wonderful for contemplation, and indeed for practice, even though it is not for common use.[362]

Leibniz was clearly convinced that his binary system could provide fundamental insights not only into the nature of various series of numbers but also be of use in more other areas. Unfortunately, he leaves it open how much and in which sense it might explain the nature of created substance: "[I]t is unclear how the simple negations of divine perfections could provide enough determinate content for all positive creaturely properties. The fact that I am not omnipotent cannot alone establish how much power I have."[363] While it seems clear that creaturely perfections are not an all-or-nothing affair and hence, strictly speaking, are not composed of a string of absolute divine perfections as such and absolute absence thereof, i.e. absolute non-being, the analogy might indicate something else.

Despite the fact that it might be unclear how this analogy works in the details, Leibniz entertains this reasoning explicitly in some places and, in doing so, extends or specifies the notion of 'perfection'. In a letter to Duke Rudolph August from 8 May 1699, Leibniz stresses that part of the explanatory value of the binary system is its ability to show not only how creatures are composed, but also that this creation is beautifully ordered:

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[362] Letter to Schulenburg, 29 March 1698, SL 39. See also Samuel Newlands, "Leibniz on Privations, Limitations, and the Metaphysics of Evil," *Journal of the History of Philosophy* 52.2 (2014), 295 and Antognazza, "Metaphysical Evil Revisited," 131.
[363] Newlands, "Leibniz on Privations, Limitations, and the Metaphysics of Evil," 295.

> First and foremost it should be remembered that this [i.e. the binary] way of calculating is not meant as if it should be introduced in general use, but it serves for the contemplation of the nature of numbers themselves as well as many splendid and also useful qualities as are concealed therein; also of the wonderful model of creation, as it comes about therein.[364]

What the creation out of divine perfection and nothingness shows, Leibniz seems to suggest here, is their harmony and order. Once one produces a table of the natural numbers, one will see certain repetition and regularities in the columns.[365] But, on a *prima facie* reading, one might also be led think that there is only one perfection (corresponding to 1) and its negation (corresponding to 0), a thought that would dovetail with what seems an overall reductive program that seeks to view the constitution of substance fundamentally as an active principle limited by a passive principle, which can equally be viewed as a the limitation of perfection or confusion in perception.

But Leibniz also connects his idea of the binary system with another aspect of what it means to be a perfection: "One can see also in this model that in all things of the whole world there is a beautiful order, if only one arrives at the right origin, namely 0 and 1. One and nothing else."[366] That Leibniz connects the idea of perfection, here mirrored by a creation out of God and nothing, with the idea of order is not unheard of. It features more prominently in his correspondence with Christian Wolff during Leibniz's final years.

> *Perfection* is the harmony of things, or the state where everything is worthy of being observed, that is, the state of agreement *[consensus]* or identity in variety; you can even say that it is the degree of contemplatibility *[considerabilitas]*. Indeed, order, regularity, and harmony come to the same thing. You can even say that it is the degree of essence, if essence is calculated from harmonizing properties, which give essence weight and momentum, so to speak. Hence, it also follows quite nicely that God, that is, the supreme mind, is endowed with perception, indeed to the greatest

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[364] "Zu förderst wird erinnert, daß diese art zu rechnen, gar nicht dahin gemeinet, als ob man sie im gemeinen Gebrauch einführen solte, sondern sie dienet zur betrachtung, so wohl der Natur der Zahlen selbst und vieler treflichen auch nüzlichen Eigenschafften so darinn verborgen; als auch des wunderbaren Vorbilds der Schöpfung, so sich darinn ergiebet." (Leibniz für Herzog Rudolf August, Beilage zu Brief vom 8. (18.) Mai 1969, AI.xii.67.)

[365] ibid. A I.xii.69.

[366] "Man siehet auch bey diesem Vorbild, daß in allen Dingen der ganzen Welt eine schöhne ordnung sey, wenn man nur auf deren rechten Ursprung komt, nehmlich 0 und 1. Eins und sonst Nichts." (AI.xii.70)

> degree; otherwise he would not care about the harmonies.[367]

Leibniz seems to run together a wide variety of notions in this late letter, but it might help us understand how he views the constitution of imperfect creatures. What makes it so difficult to understand the analogy between binary numbers and the constitution of creatures is that creatures seem precisely not to carry divine perfections (and their absolute negations), but perfections to a limited degree.[368] Here the degree of essence is defined in terms of harmony, and the analogy with the binary system might need to be understood in this harmonic sense rather than giving illuminating insight into the constitution of created substances.

But, as is frequently the case with Leibniz, we might have a different understanding of 'limitation' than the one Leibniz has in mind. In other texts we find a different explanation of perfections, which does not construct them in terms of opposition or negation. For him, these limitations are not in fact something that has been taken away, but they are boundaries or the denial of further progress:

> Without doubt boundaries or limits are of the essence of creatures, but limits are something privative and consist in the denial of further progress. At the same time it must be acknowledged that a creature, after a value is received from God and such as it affects the senses, also contains something positive or something beyond boundaries, and cannot in fact be resolved into mere limits or indivisibles. And hence I also think that what is postulated by the sense of the author's theses, from which he infers the resolution into mere limits or mere indivisibles, cannot be applied to a creature taken with its value. And this value, since it must consist of a positive, is a certain degree of created perfection, to which the power of action also belongs, which in my view constitutes the nature of substance. So much so that this value bestowed by God is in fact the energy or power imparted to things, which some people deny in vain, not noticing that they themselves, contrary to their expectation, fall into the doctrine of Spinoza, who makes God the only substance and everything else modes of it.[369]

What Leibniz seems to deny is that the perfections of creatures are quantities such

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[367] Leibniz to Wolff, 18 May 1715, AG 233-34.

[368] Not everyone is convinced that Leibniz is serious his commitment to an analogy between creation and the binary system. See, e.g., Hans J. Zacher, *Die Hauptschriften zur Dyadik von G. W. Leibniz. Ein Beitrag zur Geschichte des binären Zahlensystems* (Frankfurt am Main: Vittorio Klostermann, 1973), 34-55.

[369] Letter to Johann Christian Schulenburg (29 March 1698), Strickland 38.

that they can be easily measured and dissolved into discrete unities or indivisibles whose accumulation would render a measure which can be used to rank individual perfections on a numerical scale. As the point – the limit or boundary of a line – does not mark the cut-off of a finite line from an infinite line such that the infinite remainder beyond the point is negated of it, so is a limited perfection not merely a cut-out of an infinite perfection or the simple negation of an infinite degree of perfection.[370] The picture suggested by this is similar to a view we encounter also in the case of primitive active and passive force when compared to their derivative counterparts. While the latter are quantifiable and measurable, there seems to be a gap between them and their primitive grounds, which prevents the former from being quantifiable. But it is also the fact that they are not quantifiable that preserves the possibility of their simplicity. The fact that they are not composed of parts, guarantees their unity and simplicity, a view that is also supported by Leibniz's view on how to construct the properties of finite things without recourse to infinitesimals.

This similarity is also supported by the idea of a hierarchy of monads that Leibniz presents in the *Monadology*: Based on the above account of imperfections and in accordance with the principle of continuity, i.e. one of Leibniz's "great and best confirmed maxims that *nature never makes leaps*"[371], we seem to arrive at a picture of an ordering of an infinite number of substances with God at the top, followed by "minds or rational souls"[372], "souls where perception is more distinct and accompanied by memory"[373], and entelechies (in the sense of Monadology §19 as "simple substances which only have perceptions"[374]). But what, one might ask, does the analysis of the limitation of creatures add to the overall analysis attempted here? What is clothed here in theological considerations about imperfections of the created substances, is intimately connected with the considerations about activity/passivity and form/matter, a connection that is already in place at least by 1686, and, of course, with the overall constitution of substance:

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370 A possibly similar view is proposed by Antognazza, but in terms of various aspects that can be negated. (See Antognazza, "Comments on Adams 'The Priority of the Perfect'," 129-30.)
371 A VI vi 56/NE 56.
372 Monadology §82: G VI 621/AG 223.
373 Monadology §19: G VI 610/AG 215.
374 ibid.

> When a change takes place by which several substances are affected (in fact every change affects all of them), then I believe one may say that the substance which immediately passes to a greater degree of perfection or to a more perfect expression exercises its power and *acts*, and the substance which passes to a lesser degree shows its weakness and *is acted upon* [*pâtit*].[375]

If action is a perfection and passivity an imperfection, and "the *primitive force of being acted upon* [*vis pimitiva patiendi*] or of *resisting* constitutes that which is called *primary matter*"[376], and if imperfection is a privation or limitation, i.e. nothing rather than something, then primary matter (and therefore to some extent possibly also the derivative secondary matter) seems to be nothing positive or ontologically given, but a consequence of the limitation which constitutes the difference between God, who is pure activity, and the limited substances subject to passions.[377]

This account, the idea of a continuum of creatures that is bound by two extremes, namely God as the absolute perfect and purely active being on the one hand and nothingness or absolute nonbeing on the other, with only a difference in degree rather than kind, is also supported by Leibniz's accounts of the nature of angels. They must move within these given boundaries as well, since "[n]o creature can be without nonbeing; otherwise it would be God. Angels and saints must have it."[378] In this writing of the 1690s, as we have already seen, Leibniz ascribes the essential limitation of all created substances to a certain participation in nonbeing. Such a notion of limitation might also serve to solve Adams's puzzle about how limitation would not threaten simplicity: Since non-being does not add anything positive, or, rather is original and essential to the substance, limitation or imperfection does not consist in something being taken away as if the perfection-in-the-maximum had parts that could be removed, it does not threaten the simplicity neither of the substance itself nor of its perfections.

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375 Discourse on Metaphysics (1686) §15: G IV 441/AG 48.
376 'Specimen Dynamicum', GM VI 236-7/AG 119-20.
377 In a Letter to Remond (11 February 1715), Leibniz writes: "Au reste, comme les Monades sont sujettes aux passions (excepté la primitive), elles ne sont pas des forces pures." (G III 636.)
378 DS I 411/L 386.

5.2. Metaphysical Evil

From this essential or original limitation, a further constraint seems to be imposed on created substances. It is not only some basic fact about simple substances, but it extends further to the derivative physical constitution of substances, which is equally similar across all creatures: "I am inclined to believe that all finite immaterial substances – in the opinion of the ancient Church Fathers, even the genii or angels – are joined to organs and accompany matter and even that souls or active forms are found everywhere."[379] Even though, when one considers sicknesses and the overall rather rickety construction of what is our body, it might be suggested that this body is an unnecessary further constraint imposed on creatures, Leibniz regards it as well supported and a contribution to the overall perfection.

> [T]his very fragility is a consequence of the nature of things, unless we are to will that this kind of creature, reasoning and clothed in flesh and bones, be not in the world. But that, to all appearance, would be a defect which some philosophers of old would have called *vacuum formarum*, a gap in the order of species.[380]

There is a twofold notion of creaturely limitation of perfections in play, which clearly mirrors the twofold notion of passivity or matter that restricts the action on a metaphysical and on a physical level, respectively. In simple substances we find primitive passive power or essential creaturely limitation that consists in nonbeing or privation only. As such, it does not threaten their simplicity and hence their true unity, since it does not add anything positive such that the simple substance resulting from primitive powers would be composed of two different, separable principles.[381] But this fundamental and purely privative matter or original limitation is to be distinguished from its derivative effects, to which it gives rise to some extent, when collaborating with infinitely many other simple substances. Because

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[379] 'On What is Independent of Sense and of Matter' (Letter to Queen Sophia Charlotte of Prussia, 1702), G VI 507/L 552.
[380] T §14.
[381] Similarly, given the connection between perfection, activity and perception, confused perceptions (as the epistemological equivalent to primary matter) are more strongly limited perceptions when compared to clear perceptions, but not different in kind.

secondary matter is a collection of substances, it is not purely negative or passive, even if some of its properties derive from the privative nature of primitive passive power. But due to the positive nature of the substances involved, it is, in some sense, also created by God. And in this way Leibniz can claim that God is a substance without matter in the twofold sense, as a simple, absolutely independent, and exclusively active substance he is neither limited by any passivity nor can he, therefore, enter into secondary matter or a body that is the coming together with other simple substances: "God alone is a substance without matter, for it is he who created matter itself"[382], he alone has neither primary matter – which is nothing but negation or privation, nor enters into an organic body as a constituent of some secondary matter.

This reductive account that views perfections and imperfections in the light of activity and passivity might also illuminate further the relation of what Leibniz calls 'physical' (suffering), 'moral' (sin), and 'metaphysical' evil of which the former two are derivations.[383] What grants the derivative forms of evil their status as an evil is based on their lack of perfection or goodness, i.e. it is the fact that they have a privative origin. As phenomena they appear in intimate connection with their active counterpart and hence as partially positive, i.e. as actions of some kind. But this is not to say that the evil aspect of their character is based on the primitive active force or original perfection that grounds their positive aspect, which is created by God.

It is essential in this context that God is not the cause of primary matter if it can indeed be identified with creaturely limitation, since this limitation is the source of evil in the world. Otherwise it would seem as if God participates in the existence of evil by the very act of creating substances – a consequence Leibniz surely did not want to draw. And in his *Theodicy*, he offers several historical accounts that attempted to exonerate God from the charge of causing evil. Ancients, Leibniz claims, thought that there is uncreated matter that forms the

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382 LDB 61.

383 Straightforwardly, the texts on evil, especially the Theodicy, allow also for a different reading that subsumes moral and physical evil under metaphysical evil; see Michael Latzer, "Leibniz's Conception of Metaphysical Evil," *Journal of the History of Ideas* 55.1 (1994): 9. For a more complex construction of the possibility of moral and physical evil, see Newlands, "Leibniz on Privations, Limitations, and the Metaphysics of Evil," 298-99.

basis for evil and which is, as uncreated, independent of God. But an answer like this is not available to Leibniz and most his contemporaries.

> But we, who derive all being from God, where shall we find the source of evil? The answer is, that it must be sought in the ideal nature of the creature, in so far as this nature is contained in the eternal verities which are in the understanding of God, independently of his will. For we must consider that there is an *original imperfection in the creature* before sin, because the creature is limited in its essence; whence ensues that it cannot know all, and that it can deceive itself and commit other errors.[384]

Given divine foreknowledge, God will know before creating the best of all possible worlds which sins individual creatures will commit and which other evils will arise. But, at the same time, he cannot be held responsible for those evils and sins. He puts imperfect, sinful substances into being, but he does not put the imperfections themselves into being, for a simple reason: Those imperfections are nothing that could be put into being, since they do not constitute anything positive:

> God will be the Understanding; and the Necessity, that is, the essential nature of things, will be the object of the understanding, in so far as this object consists in the eternal verities. But this object is inward and abides in the divine understanding. And therein is found not only the primitive form of good, but also the origin of evil: the Region of the Eternal Verities must be substituted for matter when we are concerned with seeking out the source of things.
> This region is the ideal cause of evil (as it were) as well as of good: but, properly speaking, the formal character of evil has no *efficient* cause, for it consists in privation, as we shall see, namely, in that which the efficient cause does not bring about.[385]

There is an essential imperfection inbuilt into created substances, which is unavoidable, but which, furthermore gives rise to or forms the basis of further evil. Again the system build to accommodate sins, but resolving God from complicity in it, mirrors the structure of primitive and derivative forces. There is metaphysical evil on the most fundamental level, which is mere imperfection or non-being, giving rise to the possibility and actuality of physical evil, which consists in

[384] T §20.
[385] ibid.

suffering and moral evil or sin, and the effect of primitive privations is seen predominantly in experienceable actions of created beings.

The lack of God's cooperation in the genesis of evil is illustrated by suggesting it being analogous, if not the same as, inertia. The starting point is establishing a connection with the tradition: "[O]ne must consider the truth [...] that evil is a privation of being, whereas the action of God tends to the positive"[386], and, Leibniz goes on, this can be set in analogy with physical phenomena we observe, namely "the 'natural inertia of bodies'; and it is something which may be regarded as a perfect image and even as a sample of the original limitation of creatures, to show that privation constitutes the formal character of the imperfections and disadvantages that are in substance as well as in its actions."[387] If one considers boats going down a stream, those that are heavily laden will go down the very same stream slower than lighter boats will. But since going downstream does not require an active effort on behalf of the boat, it shows that it is the matter that deprives the boat of speed or that reduces the boat's receptivity towards the impression of action from the river. And this is analogous to God's relation to creatures. God is the cause of perfection in action, as the current supplies the boat with the action of going downstream, but the limitation of receptivity is to be found in the creatures (or boats) themselves. And it is this limitation that causes any defects in actions.

> Thus the Platonists, St. Augustine and the Schoolmen were right to say that God is the cause of the material element of evil which lies in the positive, and not of the formal element, which lies in privation. Even so one may say that the current is the cause of the material element of the retardation, but not of the formal: that is, it is the cause of the boat's speed without being the cause of the limits to this speed. And God is no more the cause of sin than the river's current is the cause of the retardation of the boat. Force also in relation to matter is as the spirit in relation to the flesh; the spirit is willing and the flesh is weak, and spirits act . . .*quantum non noxia corpora tardant.*[388]

The equation of limitation or original evil with non-being allows Leibniz to regard God as the origin of all action, perfection, positive, or good, while

[386] T §29.
[387] ibid.
[388] ibid.

imperfections and defects in operations are derivable from the original limitation of creature. Therefore, it is not necessary to introduce a positive principle in order to account for the existence of evil.

> Evil itself comes only from privation; the positive enters therein only by concomitance, as the active enters by concomitance into cold. [... C]old is a certain privation of force, it only comes from the diminution of a movement which separates the particles of fluids.[389]

It is, furthermore, the case that imperfection as a privation in creatures is the principle of passivity or of negation, and as such stands in a relationship of mutual dependence to the principle of activity or perfection, i.e., to the substantial form. As such, imperfection is absolutely inseparable from perfection, because it has to be viewed as being within the substance itself and because it is nothing but the limitation of perfection. Abstracted from the substance, it seems to be even less, namely not even conceivable at all.

Such a reconstruction would maintain Leibniz's thought that all substances are fundamentally constituted in the same way, such that there is one explanation of all created as well as (the one) uncreated substance. It also circumvents the worry that created substances *qua* being limited would be rendered infinitely evil due to infinite shortcomings in perfection in comparison with the one infinite substance.

[389] T §135.

6. Simple Substances as Points and not as Parts

6.1. The Analogy with Mathematics and its Boundaries

Leibniz, as we have seen, argues repeatedly that one of the shortcomings of matter is the fact that no principle of real or genuine unity can be found within it, because it is a mere collection or aggregation of parts *ad infinitum*. But, as one of Leibniz's claims goes, the reality of a multitude is derived only from true unities; hence such true unities must be found somewhere as grounding principles. In his 'New System' Leibniz offers several possible candidates that might fulfil this role and he is quite clear that it must be some kind of points that do so, either physical or mathematical or metaphysical points. Physical points, some kind of atoms in the traditional understanding of the term, can be excluded on the basis that their notion is incoherent or at least implausible. No thing can be material, if matter is understood to be something extended, and hence to be something that has parts of some kind, and perfectly indivisible at the same time, and therefore, Leibniz claims, it cannot possess genuine unity.[390] We see here that Leibniz's notion of indivisibility goes beyond physical inseparability. He denies, and given the Principle of Sufficient Reason it seems to be a denial on solid Leibnizian grounds, that something can have physical parts that are strictly speaking inseparable, unless some reasoning can be given that justifies this claim. As long as there is no such principle, the assumption of atoms as physical points that are extended but indivisible is nothing but question begging.

But neither can this grounding principles be mathematical points, since they are nothing real, but merely ideal modalities or extremities, that is, abstractions. And even though physical points are considered to be unacceptable and mathematical points might possess the required unity, but lack reality, Leibniz sees good reason in referring to his genuine unities nonetheless by using the term 'point':

[390] 'New System' (1695), G IV 478-79/WF 11-12.

> It is only *atoms of substance*, that is to say real unities absolutely devoid of parts, that can be the sources of actions, and the absolute first principles of the composition of things, and as it were the ultimate elements in the analysis of substances. They might be called metaphysical points; they have *something of the nature of life* and a kind of *perception*, and *mathematical points* are their *point of view* for expressing the universe. But when a corporeal substance is contracted, all its organs together make what to us is only a *physical point*. Thus the indivisibility of physical points is only apparent. Mathematical points really are indivisible, but they are only modalities. It is only metaphysical or substantial points (constituted by forms or souls) which are both indivisible and real, and without them there would be nothing real, since without true unities there would be no multiplicity.[391]

These 'atoms of substance' Leibniz is looking for are simple, i.e. 'absolutely devoid of parts', and, as we have already seen, not only active themselves, but also the ultimate foundation for the activity we find derivatively among the physical objects we encounter in our sense perception of the world. Similar to the simple concepts of his combinatorics[392], they are the most fundamental level in the analysis of more complex things, in this case of (corporeal) substances. It seems also straightforwardly clear why Leibniz thinks that physical points do not suffice as the basic unities he is looking for: The objects we derive at by contracting "the animal, that is, the corporeal substance, which the dominating monad" together with "the organic machine, for which innumerable subordinate monads come together"[393], will only constitute a minute physical object. But this object will not be a point in the strict sense, since its indivisibility is only an apparent one. Such a point amounts to nothing more than the atoms of the mechanistic philosophy endowed with some activity, and therefore to nothing more than objects that are nonetheless extended, but that will not qualify as unities in the strict sense. This claim does not only serve to illustrate the difference between the metaphysical and physical points, but it also entails the further assumption that the animal itself, even when contracted or enfolded to the maximum degree, and therefore also when it is unfolded in the

391 'New System' (1695), G IV 482-83/WF 16.
392 See Chapter on DAC.
393 To De Volder, 20 June 1703, LDV 265.

highest degree obtainable to it due to its nature, does not have genuine indivisibility and is, hence, not a substance in the strictest sense.

But the discussion of physical points shows in addition that Leibniz has definitively arrived at a solution for the problem of unity of substances. The charge is still that atomists as well as the Cartesians struggle with giving a sufficient explanation for the cohesion of the parts of an atom and a body, respectively, and cannot provide reasons as to why some parts should form an atom rather than other parts or indeed all parts, i.e. why the whole plenum should not rather be one unified substance.[394] It is this charge and his solution that supply another reason that serves Leibniz in justifying his metaphysical points: these points possess the absolute unity of a partless and indivisible thing that, as a simple point, does not require any further explanation of its unity at all.

The main motivation Leibniz indicates in the passage cited above for referring to substances as 'points' seems to be their indivisibility, but he also introduces the notions of 'ideal' and 'real' as one of the criteria for distinguishing mathematics and metaphysics. Spelling out this difference between points in this way is also the solution Leibniz sees for the 'labyrinth of the continuum'.

Mathematical objects, such as (mathematical) extension or space, as well as the surfaces, lines, and points that can be conceived in it, are, for Leibniz, merely relational systems comprising the relations of all possible existents (of which all actual existents are hence a subset).[395] While the ideal or abstract allows for a 'top down' view, where the whole is prior to the parts, such as in numbers or lines, which come before their fractions, and which are therefore indefinite concerning their division, concrete physical objects. These physical objects are on the one hand actually infinitely divided, i.e., their parts are prior and their division is definite. But they are, on the other hand, also the result of a multiplicity of real simple substances, that is, of discrete unities from which they derive their reality. Concerning the continuum, the difference between the actual and the ideal is that ideal objects are not made of basic elements and that the relations they comprise (i.e. all possible relations) involve eternal truths. The phenomena of nature, given

[394] This view of extended substance as having unity as a whole, i.e. of there being only one extended substance, is proposed to Leibniz by De Volder.
[395] 'Remarks on M. Foucher's Objections' (1695), G IV 491/WF 45.

that the ideal comprises all possible relations, are therefore accordingly structured, i.e. they have one determinate structure or division that is contained (among an infinity of others) in the ideal. When we consider real things, we are therefore concerned with the divisions that are actually made and which have the whole as a result.

> In fact, the number of simple substances which make up a mass, however small that mass may be, is infinite, since in addition to the soul which constitutes the real unity of an animal, the body of a sheep (for example) is actually subdivided: that is to say, it too is an assemblage of invisible animals or plants, which themselves are also compounded, in addition to also having that which makes up their own real unity. And even though this goes on to infinity, it is obvious that, all in all, everything comes down to these unities, all the rest, or the resultants, being only well-founded phenomena.[396]

The argument Leibniz seems to have in mind is that mathematics deals with objects that comprise all possibilities and is independent of the reality of its objects, while actual existing things are, for obvious reasons, quite dependent on being real or having existence. This idea serves Leibniz occasionally to defend his infinitesimals against criticisms since it allows him to claim that mathematics is free to use notions that have no correspondence to things in nature, i.e. that mathematical analysis is not dependent on metaphysics and therefore the existence of infinitely small or great lines or other infinitesimal quantities is not necessary for them to be used as ideal concepts.[397] The same reasoning gives rise to the claim that continuity is ideal, and that nothing in nature has perfectly uniform parts, even though the real "never ceases to be governed perfectly by the ideal and the abstract"[398].

This is of interest for Leibniz's metaphysics, because it is connected with the analogy he draws between points and monads, and because it provides some further reasoning for why he regards monads as 'metaphysical points'. Points neither compose the continuum that is a line nor do monads compose a continuous extended substance.

> A continuum is infinitely divisible. And this holds for a straight line or

[396] ibid. G IV 492/WF 46.
[397] Letter to Varignon, 2 February 1702, GM IV 91/L 542-3.
[398] ibid., GM IV 93/L544.

> what is formed from it, since a part of a line is similar to the whole. And so, since the whole can be divided, the part can be also, and similarly any part of the part. Points are not parts of a continuum but extremities, and there is no more a least part of a line than a least fraction of unity.[399]

What is continuous and therefore also divisible can always be split in further smaller parts of the same kind as itself is, such as any line, no matter how short, will always be divisible into two even shorter lines. In the same way every extended body will always be divisible into smaller, but likewise extended bodies, without ever reaching an either unextended or indivisible smallest body (or a physical point in the strict sense of point). Even though not even an infinite number of points can compose a line, they are nonetheless fundamental for the existence of the line. And the relation of a point to a line is analogous to the relation of a monad to extension:

> That is, a simple substance, even though it does not have extension in itself, nonetheless has position, which is the foundation of extension, since extension is the simultaneous continuous repetition of position, just as we say that a line comes to be from the flux of a point, since in the trace left by a point its different positions are connected. Yet an active thing cannot arise from the repetition or continuation of an inactive thing.[400]

And hence the function of monads is similar to that of points. Due to their lack of extension, points or monads can only contribute something to the extended objects, i.e. lines and extended bodies, respectively, by means of some kind of action or motion, such as a line is the path of a moving point. But they cannot, as essentially unextended things, immediately compose them or enlarge their quantitative extension. "[T]he primary matter proper to an entelechy, that is, the primitive passive power that is inseparable from the active power, is created with the entelechy itself (which it completes, so that it constitutes a monad or complete substance) [… and] does not enlarge the mass, or the phenomenon resulting from

[399] Leibniz to Des Bosses, 14 Feb 1706, LDB 21. A similar point is made in the 'Notes on Fardella' (1690), A VI iv 1669/AG 103: "Such an indivisible substance is characterized by not being a part of a body, but "rather as an essential, internal requisite, just as one grants that a point is not a part that makes up a line, but rather something of a different sort which is, nevertheless, necessarily required for the line to be, and to be understood".

[400] Leibniz to Des Bosses, 21 July 1707, LDB 99. Cf. also 'Metaphysical Foundations of Mathematics' (after 1714), where a line is defined as 'the path of a point'.

the monads, any more than a point enlarges a line."[401] As it is fundamentally the activity of simple substances that gives rise to the phenomenon of extension or to extended phenomena, so is the line as the path, i.e. "the continuous and successive locus of a movable thing"[402], arising from the motion of a point. This analogy, in turn, provides evidence for a fundamental difference between the metaphysical basis, the primitive active and passive force of a simple substance, and their derivative expressions in physical phenomena: An increase in the basis does not result in a measurable increase in the derivative forces, in the way that adding points to a line does not lead to a longer line. This lack of quantity and thus the lack of measurability seem essential to simple substances, in order to guarantee and uphold their simplicity. They are characterized by qualitative and not quantitative qualities. But this, by itself, poses a problem for the relation between monads and well-founded phenomena: while these phenomena are well-grounded due to the existence of the monads that give rise to them, there does not seem a necessary correspondence between the active forces and their derivations, since one can increase and decrease, while the other stays constant. It is, therefore, unavoidable to assign an essential role to perception and pre-established harmony in order to account for the behaviour of physical phenomena.

But there is another aspect that metaphysical and mathematical points share and which further adds to the notion of simplicity. What it means essentially to be a point is to lack quantity, and hence to be considerable only under the aspect of quality. Here we find another reason for the fundamental difference between extension, as a spatial quantity, and simple substances, and the warning that one should not be considered under the aspect of the other. "Those things that pertain to extension should not be attributed to souls, and their unity and multitude should not be taken from the category of quantity, but rather from the category of substance, that is, not from [physical] points, but from a primitive force of

[401] Leibniz to Des Bosses, 16 March 1709, LDB 199. Similar in his letter to Des Bosses of 30 April 1709: "Extension indeed arises from situation, but it adds continuity to situation. Points have situation, but they neither have nor compose continuity, and they cannot subsist by themselves. Thus nothing prevents an infinity of points from continually arising and perishing (or at least coinciding or being placed outside one another) without an increase or decrease of matter and extension, since points are only modifications of extension—not parts, of course, but boundaries." (LDB 125.)

[402] 'The Metaphysical Foundations of Mathematics' (after 1714), GM VII 20/L 668.

operating."[403] Even though points cannot be considered as quantities, they nonetheless form the foundation of the quantities – in the way that primitive active and passive forces as the qualitative determination of individual simple substances or monads give rise to derivative active and passive forces. These derivative forces, since they are quantitative and hence measureable and mathematizable properties, ensure the possibility of physics as a proper science.

The determination of these points is based on their internal properties and does not require the compresence of other objects that can serve as a yardstick or as an essential addition to the definition of the thing. Rather, it is the qualities of the simple thing itself that allow for its determination, individuation, and explanation:

> To make this more understandable, we shall now leave out of consideration all that we see in the particular things in which distance is involved and consider them as if they contained no plurality of properties; that is, we shall consider them as points. For that is a point in which nothing else can be assumed to coexist, so that whatever is *in it is it*.[404]

It is worth noticing in this passage that Leibniz indicates a radical reduction, that we have so far more or less only deduced from his writings: It is not a plurality of properties that is in a point. Such an explanation sits well with a proposed reduction to one essential principle – active force – in the case of a metaphysical point, i.e. in a simple substance. Viewed in this way, it also becomes clear why Leibniz is not worried that essential simplicity endangers a multiplicity in the world, but is a prerequisite for it. For simple substances, *"mathematical points* are their *point of view* for expressing the universe"[405], and even though it is not entirely clear what Leibniz means by this,[406] we find further indications of this view:

> [...] the simplicity of a substance does not prevent the plurality of modifications which must necessarily be found together in the same simple substance; and these modifications must consist in the variety of relations [*rapport*] which the substance has with things outside. In the same way there

[403] PS on draft of letter to Des Bosses, 30 April 1709.
[404] 'The Metaphysical Foundations of Mathematics' (after 1714), GM VII 25-26/L 671.
[405] WF 16.
[406] Margarita R. Levin, "Leibniz' Concept of Point of View," *Studia Leibnitiana* 12.2 (1980).

> may be found, in one centre or point, though it is perfectly simple, an infinity of angles formed by lines which meet in it.[407]

It seems that its simplicity is what grants the possibility of an infinite variety of perceptions coming together in a substance. It is not only the unification in a point that is relevant, that its character as partless grounds also the possibility for it to be the centralized *relatum* of an infinite number of relations to other substances in the world, similar to a point in which not only lines, i.e. shortest connections with other points, come together, but which at the same time give rise to an infinite number of angles.[408] And such a role of being a centre for an infinite number of properties, it seems, can only be fulfilled by something that is essentially simple and therefore does not require a further principle of unification for all these different relations and properties. The simple substance unites an infinite number of angles in one point of view.

6.2. Mereology: The Constitution of Wholes and their Parts

Given the important role that composite objects, their ontological status and relation to simple substances play in the argumentation for monads, and given that the essential definition of 'simple' is 'not having parts', taking a final, but tentative look at Leibniz's mereology might provide useful clues for any further discussion. We have already seen that from a metaphysical point of view there is something fundamentally wrong with genuine parts as far as substantiality is concerned. But a clearer notion of parthood will also illuminate the relation between 'being a part' and 'being a constituent' or 'being an immediate requisite', a difference crucial in Leibniz's explanation of the relation between substances and bodies.

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[407] Principles of Nature and Grace §2: G VI 598/AG 207.

[408] A similar view is indicated in Helmut Pape, "Über einen semantischen Zusammenhang von projektiver Geometrie und Ontologie in Leibniz' Begriff der Perspektive," in *Leibniz und Europa: VI. Internationaler Leibniz-Kongreß. Vorträge 1. Teil*, ed. Albert Heinekamp and Isolde Hein (Hannover: Gottfried-Willhelm-Leibniz-Gesellschaft, 1994).

The clearest exposition of 'part' can be found in the 'Metaphysical Foundations of Mathematics'[409] (1715), which includes the following definitions:

1. A *quantity* or magnitude is what can only be known through compresence, because it requires the presence or prior presence of a further thing, with which the thing in question is to be compared.

Magnitudes such as extension seem to be what is given in the imagination or perception, a property of either abstract or concrete mathematical objects or the phenomenal extended bodies of our perception, but its exact determination is dependent on comparison with another thing that is used as some means of measure.

2. A *quality* is what can be conceived in a way sufficient for their definition without requiring the compresence – in difference to a quantity or magnitude – of another thing.

Qualities are non-relational and contain their full explanation in themselves, i.e. they do not need to be compared to other qualities of the same kind in order to be defined. Here we see the essential difference between the extension and activity of bodies in contradistinction to the activity of substances that gives rise to them. The former require other bodies in order to be compared with them and for their size and motion to be determined. The activity of substance as a quality is not quantifiable or a geometrically determinable and measurable, but fundamental and self-contained.

3. *Equal* is what has the same quantity.
4. What is *similar* has the same qualities and can thus be distinguished only when compresent.
5. Two things are homogeneous when they have equals which are similar to each other: "Given *A* and *B*, and given that *L* equals *A* and *M* equals *B*, and that *L* and *M* are similar, then *A* and *B* are homogeneous."[410]
6. One thing *is in* another or is an *ingredient* of another thing, if with the positing of the latter the positing of the former is immediately understood.
7. A *part* is a homogeneous ingredient of a whole.

[409] GM VII 17-29.
[410] GM VII 19.

These definitions themselves confront the interpreter with several problems and questions, especially if they shall be considered in connection with Leibniz's substance theory. But they are, after called, *metaphysical* foundations of mathematics. First of all, it is worth noting that the distinction between qualitative and quantitative properties is not entirely clear. Concerning quantities, it is uncertain to what extent they are relational, as the requirement of the presence of another object seems to suggest that they are based on some kind of comparison. But this is by no means clear. One way of viewing quantities is by considering the difference between having a particular property and having some property: "Having a particular length, say being twelve inches long, is a quantitative property. The property *having length* or being the sort of object that has length, as opposed to being a lengthless point, does not require compresence and so is not quantitative."[411] But this seems to be insufficient, as we would be inclined to think that the having of a *particular* length is a quantitative property as well, just the determination of that length requires an external object which provides us with (arbitrarily chosen) measurement units. That is to say that an object in question, e.g. a finite line, does have a certain length and that we know it must have a certain length (otherwise we would not conceive of it as being finite and also not as having parts), but in order to name this specific length, we need to compare it with some external scale. This view is also in accordance with Leibniz's example given for the determination of quantitative properties through compresence. But it is impossible to give an exhaustive definition of 'foot' as we could only give definitions which include other measurement units, such as '30.48 centimetres' or '12 inches', since those defining units would themselves require further definitions and this process of defining would go on to infinity or in a circle.[412] This suggests that quantitative properties, in order to have reality – albeit only borrowed one – are based on qualitative

[411] Cook, Roy T. "Monads and Mathematics: The Logic of Leibniz's Mereology." *Studia Leibnitiana* 32:1, 2000, 1-20; 4.

[412] GM VII 18-19: "Sic non potest cognosci, quid sit pes, quid ulna, nisi actu habeamus aliquid tamquam mensura, quod deinde aliis applicari posit. Neque adeo pes ulla definition satis explicari potest, nempe quae rursus aliquid tale involvat. Nam etai pedem dicamus esse duodecim pollicum, eadem est de police quaestio, nec majorem inde lucem acquirimus, nec dici potest, pollicis an pedis notio sit natura prior, cum in arbitrio existat utrum pro basi sumere velimus." See also NE II.xii.4: "[I]t is impossible to have the idea of an exact determinate length: no one can say or grasp in his mind what an inch or a foot is. And the signification of these terms can be retained only by means of real standards of measure which are assumed to be unchanging, through which they can always be re-established."

properties and are still, at least in the given case of an external scale for determining lengths, in some sense 'relational'. Let us assume a concrete example to illustrate this point: Given there are two finite lines *A* and B, and, as being finite, both must have the quantitative property of having a specific length. In order to know the relation of the lengths of *A* and *B*, we might either compare the two lines directly to see that '*A* is longer than *B*' or we might apply a yardstick to determine that '*A* is 10 inches long' and '*B* is 9 inches long' and thus conclude that '*A* is longer than *B*'. In both cases, some comparison between the lengths of the two lines or between the lines and some external object (a yardstick) is required. Nonetheless, the possibility of establishing any quantitative property is still based on the fact that the object that possesses such a quantity also possesses the more fundamental qualitative property. Thus, the distinction between quantitative and qualitative properties is in some sense a mirroring of the metaphysical distinction between extrinsic and intrinsic qualities, and it is in accordance with Leibniz's dictum "that *there are no purely extrinsic denominations*, denominations which have absolutely no foundation in the very thing denominated."[413]

But, furthermore, it indicates that quantitative, measurable properties are relational and grounded in qualitative properties which are themselves not composed of units that can be measured – a thought we have already encountered. We might, thus, in a simplifying manner conclude that, in the application of the 'part' in metaphysics, quantitative properties will play only a secondary role and qualitative properties are our main interest. But it is worth asking, why Leibniz introduces properties in mathematics which, in the form introduced there at least, do not enter into his metaphysics. One answer is that within the realm of ideal objects, to which those of mathematics belong, it is not problematic to include ideal relations or quantitative properties, and there, in mathematics, they are usefully employed. It seems *prima facie* unproblematic to say that certain features and properties can be found in one field, but not in another (as seems to be indeed the case with the ideal and actual continuum, i.e. infinite divisibility in abstract things

[413] Primae Veritates (1686?): C 520/AG 32. For a more thorough discussion of this issue, see for example: Mates, *The Philosophy of Leibniz*, 209-226; Massimo Mugnai, "Bemerkungen zu Leibniz' Theorie der Relationen," *Studia Leibnitiana* 10 (1978): 2-21; Cover and O'Leary-Hawthorne, *Substance and Individuation in Leibniz*, 58-86.

and the infinite division in actual things)[414]. But while they are unproblematic in the ideal realm of mathematics, they are also to be found in physics and our ordinary everyday perceptions – and as quantities in the sense we understand them now, they must be reducible to qualitative properties of underlying non-quantifiable substances.

But metaphysically even more challenging is the definition of 'similarity' as presented in the 'Metaphysical Foundations': The definition of two similar things as sharing all qualities and thus being only distinguishable by being present to the mind at the same time violates the Principle of the Identity of Indiscernibles. And on this subject, Leibniz is, as we have seen earlier, astonishingly clear. There are no two things in nature which differ only in number. Again, concerning abstract or ideal objects, which are characterized by having notions which are "incomplete or abstract ... without regard to particular circumstances"[415], the violation of this principle seems to be less distressing. It would then force one to say that the Identity of Indiscernibles is only applicable to things having a full determination, i.e. is only applicable to things which have a complete concept.[416]

There is a slight tension with other utterances within the Arnauld-Correspondence, such as the following:

> Can one deny that every thing (whether genus, species or individual) has a complete concept [notion accomplie] according to which God, who conceives of everything perfectly, conceives of it, that is to say a concept which contains or includes everything that can be said of the thing[417].

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[414] G IV 491/AG 146.
[415] G II 39/LA 41.
[416] Cook is aware of this problem, even though, allowing quantities and spatial location to make a difference in determination, the violation of the Principle of Identity of Indiscernibles appears later in the definition of congruent objects, i.e. objects which share all qualitative and quantitative properties. He offers as a solution that the Principle might be given up in mereology, because "[i]t is quite possible that Leibniz viewed the identity of indiscernibles as a contingent fact about the 'best of all possible worlds', and as a result it might not hold of his more general metaphysics of mathematical space which should apply to all possible worlds." (Cook, "Monads and Mathematics", 8.) But this proposal rests partly on the assumption that the principle in question does not hold for all possible worlds, which would require further argument. For it being true in all possible worlds, see, e.g., Hacking, Ian. "The Identity of Indiscernibles." *The Journal of Philosophy* 72:9, 1975, 249-256; 255.
[417] G II 131/ LA 73.

The most common approach to address this tension is to take a note into account, which Leibniz made in his own copy of his Correspondence with Arnauld and which introduces a distinction between full and complete concepts: "A *full* concept contains all the predicates of the thing, e.g., heat; a *complete* concept all the predicates of the subject, e.g. a hot fire. They coincide in individual substances."[418] This distinction opens up several possibilities for a distinction between complete concepts as being reserved for proper or true substances and the full concepts for abstract, so that when we speak of complete concepts, we refer to the concept of an individual substance only.[419]

We have seen so far that for Leibniz, at least by 1715, similarity (defined in a rather strong sense here as sharing all qualities) cannot be entertained in metaphysics. But with it, also homogeneity according to the definition above has to be discarded as it is based on the notion of similarity and cannot be a genuine attribute of existing things. And corresponding thoughts can be found in earlier writings, where Leibniz claims that

> it is justifiable to consider two similar triangles in geometry, even though two perfectly similar material triangles are nowhere found. And although gold and other metals, also salts and many liquids might be taken to be homogeneous, this can only be admitted with regard to the senses, and is not true that they are, in all rigor.[420]

What became visible so far is the following: Strictly speaking, i.e. according to the definition of 'parts', what appears to us to be a homogeneous, extended thing cannot in fact be such a thing, because its parts would violate the Principle of Sufficient Reason. Leibniz never doubts that we do perceive things as extended and as having parts, but now we see that is an additional reason Leibniz might have had to regard them as metaphysically suspicious.[421]

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[418] G II 49/LA 54: "Notio *plena* comprehendit omnia praedicata rei v.g. caloris; *completa*, omnia praedicata subjecti, v.g. hujus calidi. In substantiis individualibus coincidunt." Please note that G II 49 and A II.ii.71 read 'hujus calidi', Mason is following Lewis's *Lettres de Leibniz à Arnauld* suggestion of 'ignis calidi'.

[419] For such possible accounts, see e.g. Donald Rutherford, *Leibniz and the Rational Order of Nature* (Cambridge: Cambridge University Press, 1995), 119-124, or Stefano Di Bella, *The Science of the Individual. Leibniz's Ontology of Individual Substance*. (Dordrecht: Springer, 2005), 379-80.

[420] Primae Veritates (1689?): C 520/AG 32.

[421] See, e.g., Discourse on Metaphysics (1686) §21; 'Primary Truths' C 523/AG 34; 'Specimen Dynamicum'.

But there is a different relation defined in the 'Metaphysical Foundation of Mathematics', which has already been fruitfully employed by commentators: the relation of 'being in' (inesse).

> In general, we may say that an entity A "is in" an entity B if, when we posit the existence of a B, we must thereby be understood, without need of inference, to have posited the existence of an A. Put in slightly different terms, if A "is in" B, then the existence of an A (or the existence of As) is a special sort of necessary condition for the existence of a B, one which can be ascertained immediately upon examination of the nature of B.[422]

Applied to metaphysics, we arrive at the following familiar picture: If bodies are in some sense real or well-founded, then they presuppose true unities.[423] As such 'requisite' or 'constituents', the true unities are thus metaphysically prior or simpler than the bodies they constitute, and the reality of those constituted bodies is only derived from the reality of its constituents. But, in addition, it is also the case that all quantitative properties are grounded in, and are in a certain sense reducible to, qualities that are predicates of non-qualitatively determined, hence partless subject.

[422] Donald Rutherford, "Leibniz's "Analysis of Multitude and Phenomena into Unities and Reality"," *Journal of the History of Philosophy* 28:4 (1990): 539.
[423] See Rutherford "Leibniz's "Analysis of Multitude and Phenomena into Unities and Reality"," and Richard T. W. Arthur, "Presupposition, Aggregation, and Leibniz's Argument for a Plurality of Substances," *The Leibniz Review* 21 (2011).

Concluding Remarks

There might be something that rings true about Kant's claim that in a certain way "the *Critique of Pure Reason* might well be the true apology for Leibniz"[424] and that there is more similarity between the two thinkers. Leibniz, as we have seen, also thinks that there are strong reasons to ascribe a phenomenal character to the objects we perceive, while the underlying or appearing substances are, to a certain extent, unknown to us. But he seems to be more confident that his Königsberger successor that there are at least some qualities of those appearing substances that we can know with certainty, albeit not in all detail. Among them, and capturing the most fundamental aspects, is the notion of 'simplicity'.

Leibniz's first philosophical endeavours occupy themselves with finding a principle of individuation for substances, under the explicit restriction that such a principle should apply independently of any determined ontologies. Whatever the principle that makes an individual thing the thing is, it is must be applicable to all kinds of substances that there might possible be. In the following years we can see that Leibniz tries to come to grips with what kinds of things might be regarded as genuine unities, but predominantly under the aspect of trying to explain how their constitution can explain the phenomena we perceive. In his first attempts to account for these phenomena, especially this attempts to make room for the possibility of corporeal substances, their material aspect and their cohesion, he introduces the notion of substantial forms as a fundamental concept of activity and main means to establish these properties. By the time of the 'Discourse on Metaphysics' in 1686 and the following correspondence with Arnauld, he has cast serious doubt about the possibility of aggregated unities such as extension or even bodies. They are, as infinitely divisible, too close to infinitesimals, which Leibniz by then regarded as fictitious entities. With the introduction of complete individual

[424] Immanuel Kant, *Über eine Entdeckung, nach der alle neue Kritik der reinen Vernunft durch eine ältere entbehrlich gemacht werden soll* (1790), in *Akademie-Ausgabe*, *Band VIII* (Berlin: Deutsche Akademie der Wissenschaften, 1968), 251. Translated in *Theoretical Philosophy after 1781*, ed. Henry Allison and Peter Heath, transl. by Gary Hatfield et al. (Cambridge: Cambridge University Press, 2002), 336.

concepts that correspond to substantial forms, we see that the explanatory weight by now has shifted almost exclusively to those active principles that were previously treated by him as the preferred means to account for the reality of corporeal substances. But it is by no means clear that these so-called 'middle years' already entail a monadological point of view. But it seems clear that with their explanatory emphasis on substantial forms, these writings constitute a tremendous step towards such a view.

In the 1690s, these worries concerning composition and aggregation as well as the explanatory superiority seem to culminate in the introduction of 'simple substances' as the only required explanatory principle. The relativity that Leibniz ascribes to extension requires him to introduce a fundamental substance that can ground the relation of extension and must therefore itself be unextended. This idea is aided by the fact that Leibniz thinks that the aggregation of extended objects that are composed of extended parts, which themselves are composed of extended part, and so on to infinity, requires an explanation or grounding for its existence. The parts themselves cannot ground the reality, since the reality of their parts, and therefore their own reality is doubtful. If there is no fundamental level of atoms or other extended unities possible, Leibniz reasons, then there must be an unextended principle that grounds these seemingly extended objects.

Another reason for simple substances can be drawn from a wide variety of different areas Leibniz occupied himself with: As simple, these substances are not quantifiable or measurable. The problem is not only that all quantitative properties seem to fall prey to the problem of composition, but that they would also allow for a comparison with other similar quantitative properties. If they had quantitative properties, substances would not only be composed of unities that give rise to quantity, but they would also be infinitely imperfect, infinitely evil, and infinitely passive when compared to the divine substance. But, as simple and partless substances, their properties are not composed units that could give rise to a measurable quantity, and they are, therefore, not comparable – but also not fully knowable and calculable – for us.

There is, furthermore, an increasing conviction in the explanatory power of one simple, positive and active principle, that goes in its illuminating capacities

beyond what we encounter in physics and its objects. This principle also allows for an account of the essential limitation of creatures, while at the same time maintaining their analogy with a simple God as the paradigm substance. It is, furthermore, illuminated by Leibniz's frequent allusions to the analogy between mathematical points and simple substances: It is due to their simplicity that simple substances are capable of uniting an infinite number of views or perspectives in individual being.

While such a reductionist view might not be appealing to everyone, it is clearly of Leibnizian spirit. The introduction of simple substances as the fundamental building block of the universe, that are nothing more than simple, limited, active unities, allow him to ground an infinite variety of phenomena. There might be an element of doubt as to what we can know about these simple substances. But since we are limited substances, we should expect that there are some boundaries for us.

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